LOS VAQUEROS

A Water Quality and Resource Management Project
Sponsored by
Contra Costa Water District

Attachments to the Final Stage 2 Environmental Impact Report/ Environmental Impact Statement for the Los Vaqueros Project SCH #91063072

Volume II

Lead Agencies:

Contra Costa Water District
Concord, California

U.S. Department of the Interior
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Sacramento, California

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September 27, 1993

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Attachment 1. Draft Amended Water Service Contract No. 175r-3401

R.O. Draft 6/26-1992

Amendatory Contract No.
175r-3401

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

AMENDATORY CONTRACT BETWEEN THE UNITED STATES AND CONTRA COSTA WATER DISTRICT PROVIDING FOR WATER SERVICES AND FOR FACILITIES REPAYMENT

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Amendatory Contract No.
I75r-3401

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

AMENDATORY CONTRACT BETWEEN THE UNITED STATES
AND CONTRA COSTA WATER DISTRICT
PROVIDING FOR WATER SERVICES AND FOR FACILITIES REPAYMENT

THIS AMENDATORY CONTRACT is made this __day of _____, 1992, in pursuance generally of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all collectively hereinafter referred to as the Federal reclamation laws, between THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, and CONTRA COSTA WATER DISTRICT, hereinafter referred to as the District, a public agency of the State of California, duly organized, existing, and acting pursuant to the laws thereof, with its principal place of business in Contra Costa County, California,

WITNESSETH, That:

EXPLANATORY RECITALS

WHEREAS, the United States has constructed and is operating the Central Valley Project (CVP) for the purpose, among others, of furnishing water for irrigation, municipal, industrial, domestic, and other beneficial uses. The District and the United States entered into a contract, dated September 18, 1951, designated by symbol and number I75r-3401, amended November 9, 1970, providing water service from the CVP, and for construction and repayment of certain facilities. This contract is

hereinafter referred to as "the existing contract." The existing contract has been amended and supplemented through an amendment, dated April 26, 1973, and other written agreements; and

WHEREAS, the District is currently developing a Los Vaqueros Project. That project is intended to exclusively serve the District to assist it in attaining its goals of providing high quality water to District customers, while also providing reliability to the District's existing contract water supply during emergencies, droughts or other water shortages; and

WHEREAS, in order to proceed with the Los Vaqueros Project, it is necessary for the District and the United States to agree on how that Project will be utilized in conjunction with CVP water and CVP facilities. In this regard, the existing contract must be further amended; and

WHEREAS, sections 105 and 106 of Public Law No. 99-546 (100 Stat. 3050) and sections 203, 205 and 208 of the Reclamation Reform Act of October 12, 1982 (96 Stat. 1263; 43 U.S.C. §§ 390cc, 390ee, 390hh) require annual adjustment in the rates to be paid by the District for CVP water made available pursuant to this contract;

NOW, THEREFORE, in consideration of the mutual covenants herein contained, it is agreed that the existing contract, as amended, is further amended so that the contract between the United States and the District now reads, in its entirety, as follows:

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DEFINITIONS

1. When used herein, unless otherwise distinctly expressed or manifestly incompatible with the intent hereof, the terms:

(a) "Secretary" or "Contracting Officer" shall mean the Secretary of the Interior or his duly authorized representative;

(b) "CVP" shall mean the Central Valley Project, California, of the Bureau of Reclamation;

(c) Unless otherwise specifically provided, "Year" shall mean that period of time from and including March 1 of each calendar year through the last day of February of the following calendar year;

(d) "Contra Costa Canal System" shall mean the Contra Costa Canal, including the intake channel from Rock Slough, Clayton and Ygnacio Relift Canals and pumping plants, the Martinez Reservoir and Pumping Plants 1, 2, 3, and 4;

(e) "Contra Loma Dam and Reservoir" shall mean the dam, pumping plant, and reservoir constructed as an addition to the Contra Costa Canal System;

(f) "New Facilities" shall mean the Short Cut Pipeline located between Contra Costa Canal Milepost 25.70 and Milepost 47.77 and the Pump Units in Pumping Plant 1, 2, 3 and 4 of the Contra Costa Canal System;

(1) "Short Cut Pipeline" shall mean the Contra Costa Canal intake, pipeline, pipeline appurtenances, Martinez Reservoir inlet; and

(2) "Pump Units" shall mean the pump, motor, motor controls, wiring, structural supports and discharge control apparatus for pumping 100 cubic feet per second ("cfs") of water;

(g) "Lateral Distribution System" shall mean that water conveyance system constructed by the United States which consists of pipelines extending service to District water users from the Contra Costa Canal at Milepost 5.3, 6.2, 7.1, 7.3, 9.1, 14.0, 25.6, 36.6 and Y-2-6;

(h) "Project Works" shall mean all those facilities defined in subsections (d), (e), (f) and (g) of this article;

(i) The terms "water for irrigation use" or "irrigation water" shall mean water made available from the CVP which is used primarily in the production of agricultural crops or livestock, including domestic use incidental thereto, and the watering of livestock;

(j) The terms "water for M&I use" or "M&I water" shall mean water made available from the CVP other than irrigation water. M&I water shall include water used for purposes incidental to domestic uses such as the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment and water delivered to landholdings operated in units of less than two acres unless the District establishes to the satisfaction of the Contracting Officer that the use of the water delivered to any such landholding is a use described in subdivision (i) of this article;

(k) "O&M" shall mean normal and reasonable care, control, operation, repair, replacement, and maintenance;

(l) "Los Vaqueros" shall mean the Los Vaqueros Project consisting of a storage reservoir and associated facilities to be constructed by the District to store and convey Los Vaqueros water rights water and CVP water as well as additional water that may be acquired by the District;

(m) "Los Vaqueros water rights water" shall mean that water appropriated pursuant to State Water Rights Application 20245; and

(n) "CVP water" shall mean that water appropriated by the United States for the operation of the CVP in addition to and not including the Los Vaqueros water rights water; and

(o) "District Service Area" shall mean the area to which the District provides continuing service.

TERM OF CONTRACT–RIGHT TO USE OF WATER

2. (a) This amendatory contract shall be effective on the date first hereinabove written and shall remain in effect through December 31, 2010; Provided, that under terms and conditions agreeable to the parties hereto, renewals of this amendatory contract may be made for successive periods not to exceed forty (40) calendar years each. The terms and conditions of each renewal shall be agreed upon within a reasonable time prior to the expiration of the then existing contract; Provided further, that upon written request of the District to the Secretary not later than one (1)

calendar year prior to the expiration of this contract, whenever, account being taken of the amount then credited to the costs of construction of the CVP allocated to irrigation, and the remaining amount of such costs properly assignable for ultimate return by the District as established by the Secretary of the Interior pursuant to Subsection 1 (3) of Public Law 643 (70 Stat. 483) probably can be repaid to the United States within the term of a contract under subsection 9 (d) of the 1939 Reclamation Project Act (53 Stat. 1187), the portions of this contract pertaining to the furnishing of irrigation water may be converted to a contract under said subsection 9 (d) upon terms and conditions agreeable to the United States and the District; and Provided Further, that the charges set forth in the renewal of this contract for M&I water pursuant to Public Law 88-44 (77 Stat. 68) shall be set in accordance with the applicable CVP water ratesetting policy in effect at the time of renewal.

(b) The right to the beneficial use of water to which the District is entitled pursuant to this contract and any renewal thereof shall not be disturbed so long as the District fulfills all of its obligations under this contract and such renewal.

WATER TO BE MADE AVAILABLE AND DELIVERED TO THE DISTRICT

3. (a) Subject to the provisions set forth in subdivisions (d) and (e) of this Article, Articles 11 and 12 hereto, and consistent with applicable state water rights permits and licenses, the District is entitled to, and the Contracting Officer shall make available to the District, up to 195,000 acre-feet of CVP water during any Year. The quantity of CVP water to be delivered to the District in any Year shall be scheduled and

paid for pursuant to the provisions of Articles 4 and 6 hereof, which shall not exceed the quantity of water the District intends to put to reasonable beneficial use within the District Service Area during that Year. During any Year in which the District does not schedule the full 195,000 acre-feet of CVP water to which it is entitled, the United States shall put the unused portion of such CVP water to reasonable beneficial use for CVP purposes, consistent with applicable state water rights permits and licenses.

(b) In no event shall the total quantity of CVP water and Los Vaqueros water rights water, distributed within the District Service Area, in any Year for use by its customers, exceed 195,000 acre-feet.

(c) The District shall operate the Los Vaqueros Project in accordance with applicable state water rights permits and licenses.

(d) During the period commencing January 1, 1993 and ending February 28, 1993, the District is entitled to and the Contracting Officer shall make available to the District a quantity of CVP water not to exceed 32,500 acre-feet.

(e) During the period commencing March 1, 2010 and ending December 31, 2010, the District is entitled to and the Contracting Officer shall make available to the District a quantity of CVP water not to exceed 195,000 acre-feet less the quantity actually delivered to the District pursuant to subdivision (d) above.

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TIME FOR DELIVERY OF WATER

4. (a) The District shall submit to the Contracting Officer by November 1, 1992 or on the effective date of this contract, whichever is later, a written schedule, satisfactory to the Contracting Officer showing the times and quantities of CVP water to be delivered by the United States to the District during the period January 1, 1993 through February 28, 1993. In addition, the District shall furnish forecasts of its conveyance of non-project water during the months of January and February of 1993.

(b) The District shall submit to the Contracting Officer, by January 1 of each calendar year and at such other times as necessary, a written schedule, satisfactory to the Contracting Officer, showing the times, quantities and points of delivery of CVP water to be delivered by the United States to the District during the upcoming Year. In addition, the District shall furnish forecasts of its operation of Los Vaqueros Project including the times and quantities of CVP water and Los Vaqueros water rights water to be diverted to and released from storage during the upcoming Year. The District shall also provide its forecasts of the conveyance and use of non-project water during the upcoming Year.

(c) By February 15 of each calendar year, the United States shall furnish the District with its forecast of CVP operations during the upcoming 12 months. Subsequent forecasts will be furnished to the District each month through May of each calendar year as soon as such forecasts are completed.

(d) The schedules and forecasts referred to above shall be prepared and exchanged so as to provide the parties with sufficient information within a reasonable time to assist both in performing their respective obligations under this contract.

(e) Subject to the conditions set forth in Article 3(a) hereto, the United States shall deliver CVP water to the District in accordance with the initial schedules submitted by the District pursuant to subdivisions (a) and (b) above, or any revision(s) thereto submitted within a reasonable time prior to the date(s) on which the requested change(s) is/are to be implemented.

POINTS OF DELIVERY AND/OR DIVERSION--MEASUREMENT--RESPONSIBILITY FOR DISTRIBUTION OF WATER

5. (a) All CVP water made available to the District pursuant to this contract shall be delivered in Rock Slough at the intake of Pumping Plant 1 of the Contra Costa Canal System or in the Sacramento-San Joaquin Delta. Such deliveries in the Sacramento-San Joaquin Delta may be made at the intake to the Tracy Pumping Plant of the CVP at Old River, the intake of the State Water Project to Clifton Court at Old River and/or the intake to Los Vaqueros at Old River. Los Vaqueros water rights water shall be delivered and/or diverted in the Sacramento-San Joaquin Delta. Said point or points of delivery and/or diversion of CVP water and Los Vaqueros water rights water shall be subject to change by written agreements of the parties hereto; Provided, that such change(s) is/are consistent with the applicable state water right permit(s) or license(s) as they may be amended or modified. The United States shall not be

obligated to construct additional facilities for the delivery and/or diversion of water under this contract.

(b) The United States shall not be responsible for the control, carriage, handling, use, disposal, or distribution of water diverted by the District pursuant to this contract beyond the delivery points specified in subdivision (a) of this Article, and the District shall hold the United States harmless on account of damage or claim of damage of any nature whatsoever for which there is legal responsibility, including property damage, personal injury or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water beyond such delivery points; Provided, that this section is not intended to allocate the relative responsibilities of either the United States or the District under the Endangered Species Act, 16 U.S.C. 1531.

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(c) Water diverted by the District pursuant to this contract shall be measured and recorded by the District for each of the points set forth below through measuring and recording devices, acceptable to the Contracting Officer; Provided, the parties hereto, may agree in writing that such points and/or method of water measurement may be changed or added to. The District shall O&M each of the measuring and recording devices at no cost to the United States. Except for Rock Slough at the intake to Pumping Plant 1, the District shall install all measuring and recording devices.

(1) At the intake to Pumping Plant 1 of the Contra Costa Canal System;

(2) At the intake to Los Vaqueros in Old River;

(3) At the intake to the Los Vaqueros storage reservoir;

(4) At the point at which the Los Vaqueros water rights water and CVP water diverted from other than Rock Slough are introduced into the Contra Costa Canal System from Los Vaqueros; and

(5) At the points of distribution to the District's irrigation water users.

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(d) The District shall measure or compute and record daily, or at such other intervals as may be agreed upon in writing by the parties, and provide to the United States on or before the 7th day of each month following the month in which the measurement or computation was made the rates and quantities associated with the following:

(1) Diversion of CVP water at Rock Slough;

(2) Diversion of CVP water from Old River for direct use;

(3) Diversion of Los Vaqueros water rights water to storage in Los Vaqueros storage reservoir;

(4) Diversion of CVP water to storage in Los Vaqueros storage reservoir;

(5) Diversion to storage in Contra Loma Dam and Reservoir;

(6) Withdrawal of CVP water from Los Vaqueros storage reservoir;

(7) Withdrawal of Los Vaqueros water rights water from Los Vaqueros storage reservoir;

(8) Withdrawal of water from Contra Loma Dam and Reservoir for delivery to the East Bay Regional Park District pursuant to Contract No. 14-06-200-6023A, dated September 18, 1972, as amended on November 29, 1977;

(9) Withdrawal of water from Contra Loma Dam and Reservoir for purposes other than that specified in subdivision (d)(8) above;

(10) Total irrigation water distributed; and

(11) Total M&I water distributed.

(e) The District shall examine, test, and service all measuring and recording devices required by this contract to assure their accuracy. Upon the written request of either party or at least once a calendar year, the District and the Contracting Officer shall investigate the accuracy of all measuring and recording devices required by this contract and the District shall promptly correct any errors in measurement or recording disclosed by such investigation. If such devices are found to be defective or inaccurate, they shall be adjusted or repaired, or both, or replaced without expense to the United States. In the event the District neglects or fails to make such repairs or replacements within a reasonable time as may be necessary to satisfy the operating requirements of the Contracting Officer, the Contracting Officer shall determine the appropriate measurement(s) to be used to implement this contract pending the District's completion of the necessary repair(s) or replacement(s).

RATE AND METHOD OF PAYMENT FOR WATER

6. (a) The CVP water and the Los Vaqueros water rights water shall be considered M&I water except for the quantities of such water reported pursuant to subdivision (d)(10) of Article 5 above. The rates of payment to be made by the District for Los Vaqueros water rights water and CVP water made available to it pursuant to this contract shall be the applicable rates determined annually in accordance with applicable

federal law, associated regulations, and the then current ratesetting policies for the CVP. The rates applicable during the initial Year of this contract are set forth in Exhibit "A".

(b) Prior to October 15 of each calendar year, the Contracting Officer shall make available to the District an estimate of the rates of payment for the following Year and the computations and cost allocations upon which those rates are based. The District shall be allowed not less than two months to review and comment on such computations and cost allocations. By January 31 of each calendar year, the Contracting Officer shall provide the District with the final rates to be in effect for the upcoming Year. The final rates should be provided to the District in the format set forth in Exhibit "A"; Provided, that such format may be revised from time to time by mutual agreement of the parties hereto.

(c) The District shall pay the United States each Year, in monthly payments as provided herein, for the quantities of Los Vaqueros water rights water and CVP water for which the District is required to pay during each such Year, all at the rate(s) established pursuant to subdivision (a) of this article. At the time the District submits the initial schedule and forecast for each Year to the Contracting Officer pursuant to Article 4, the District shall pay the amount payable for all water scheduled and forecasted to be delivered and/or diverted pursuant to this contract during the first two calendar months of that Year. Before the end of the first month or part thereof of that Year, and before the end of each month thereafter, the District shall pay for all the water to be delivered and/or diverted in accordance with its latest schedule and forecast

during the second calendar month immediately following. Adjustments between the payments for the scheduled and forecasted amounts of water and the appropriate payments for quantities of water actually delivered and/or diverted each month shall be made by the last day of the following month; Provided, that any revised schedule and forecast submitted by the District pursuant to Article 4 which increases the amount of water to be delivered and/or diverted shall be accompanied with appropriate payment to assure that water is not delivered and/or diverted in advance of payment. In any calendar month in which the quantity of water delivered and/or diverted to the District pursuant to this contract equals the quantity of water scheduled and paid for by the District, no additional water shall be delivered and/or diverted to the District unless and until payment is made for such additional water. By February 1 of each calendar year, the District shall make any additional payment it is obligated to make for water made available to the District that Year pursuant to Article 3.

(d) In the event the District in any Year is unable, fails, or refuses to divert of the quantities of CVP water scheduled under Article 4, and made available for delivery and for which payment is required pursuant to this contract, said inability, failure, or refusal shall not relieve the District of the obligation to pay for said water and the District agrees to make payment therefor in the same manner as if said water had been delivered to and diverted by the District in accordance with this contract.

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REPAYMENT OF PROJECT WORKS

7. (a) The District shall adjust payment to the United States by December 31, 1992, so that the remaining capitalized costs of the Contra Costa Canal System on December 31, 1992 shall be $2,581,535.34. The District shall fully repay this amount, including interest at 2.5 percent per annum, by making 18 annual payments of $175,469.05, beginning January 1, 1993, and ending January 1, 2010.

(b) The District shall adjust payments to the United States by December 31, 1992, so that the remaining capitalized costs of the New Facilities on December 31, 1992 shall be $3,787,414.66. The District shall fully repay this amount, including interest at 3.342 percent per annum, by making 18 annual payments of $274,236.73, beginning January 1, 1993, and ending January 1, 2010.

(c) The District shall adjust payments to the United States by December 31, 1992, so that the remaining capitalized costs of the Contra Loma Dam and Reservoir on December 31, 1992 shall be $4,393,558.33. The District shall fully repay the amount, including interest at 3.137 percent per annum, by making 18 annual payments of $313,332.19, beginning January 1, 1993, and ending January 1, 2010.

(d) The District may, instead of making the payments provided for in subdivisions (a), (b) and (c) above, at any time, make full payment of the sum then due and owing on any or all of the facilities described in those subdivisions; Provided, that the District agrees that such accelerated repayment shall not exempt the District from compliance with the otherwise applicable ownership and full cost pricing provisions of

Federal reclamation laws. Outstanding balances to be repaid, including interest at the applicable interest rate, are shown as of December 31 of each calendar year through 2010 on Exhibit "B". If payment is made at any other time in the year, the remaining payment balance as of such date will be determined by the Contracting Officer and provided to the District. Upon full repayment, the District shall have no further repayment obligations associated with the capitalized costs specified in subdivisions (a), (b), and (c) above.

(e) The remaining capitalized costs of the lateral distribution system, including interest at 2.5 percent per annum on the portion of such costs allocated to the delivery of M&I water, are $248,774.97 as of December 31, 1992. The District shall fully repay these costs (including additional interest at 2.5 percent per annum on the unpaid costs of the system allocated to the delivery of M&I water, for the period beginning January 1, 1993 through the actual date of full repayment) within one year of the execution of this contract.

TRANSFERS OR EXCHANGES OF WATER

8. The District may sell, transfer or exchange the right to receive the CVP water provided for in this contract for beneficial uses within the State of California if, as determined by the Contracting Officer, such sale, transfer or exchange would be consistent with applicable federal and state laws and regulations then in effect and would not cause adverse effects on authorized CVP purposes or operation. No sale, transfer or

exchange of the right to receive water under this contract may take place without the prior written approval of the Contracting Officer.

PROJECT USE POWER

9. (a) During each Year, the United States shall furnish to the District the quantity of CVP project use power, not to exceed 164.8 kWh of energy for each acre-foot of CVP or Los Vaqueros water rights water, required to operate facilities needed to pump through the Contra Costa Canal System and Contra Loma Dam and Reservoir the full quantity of CVP water scheduled and the Los Vaqueros water rights water forecasted for delivery and diversion to and by the District for use within the District during that Year. Such quantity of CVP project use power may be utilized at one or more of the following locations: the Contra Costa Canal System; the intake of Los Vaqueros in Old River; Contra Loma Dam and Reservoir; and such other points of diversion set forth in Article 5(a) as may be mutually agreed upon. Project use power can only be used to convey CVP or Los Vaqueros water rights water and shall be available to pump no more than 195,000 acre-feet annually.

(b) The United States may, at any time, request in writing that the District take delivery of some or all of the CVP water made available to the District pursuant to this contract at the point of diversion for Los Vaqueros water rights water in lieu of taking delivery of such water at the intake to Pumping Plant 1 of the Contra Costa Canal System at Rock Slough. If the District agrees in writing to such a request, the United States shall furnish to the District during the term of the agreement, the

quantity of CVP project use power required to pump said CVP water and Los Vaqueros water rights water from the intake to Los Vaqueros to the Los Vaqueros transfer reservoir, not to exceed 316 kWh of energy per acre-foot; Provided, that such a written agreement by the parties for the delivery to and diversion at the intake to Los Vaqueros of the full supply of CVP water made available under this contract during the term of such agreement shall not be implemented absent a modification acceptable to the Contracting Officer of applicable Sacramento-San Joaquin Delta water quality standards during the entire term of such agreement.

(c) The District shall pay the United States for the quantity of CVP project use power as set forth in subdivisions (a) and (b) above as a component of the water rates described in Article 6(a) of this contract.

ADJUSTMENTS

10. The amount of any overpayment by the District as determined by the Contracting Officer due to the reduction(s) in water quantities described in Article 11 and/or Article 12 of this contract shall be applied first to any accrued indebtedness then due and payable by the District pursuant to this contract. Any amount of such overpayment then remaining shall, at the option of the District, be refunded to the District or credited upon amounts to become due to the United States from the District under the provisions hereof in the ensuing Year. Such adjustment shall constitute the sole remedy of the District or anyone having or claiming to have the right to the use of any of the water supply provided for herein.

TEMPORARY REDUCTIONS-RETURN FLOWS

11. (a) The United States shall make all reasonable efforts, consistent with the most efficient overall operation of the CVP, to deliver CVP water to the District at the points of delivery identified in Article 5 (a).

(b) The United States may temporarily discontinue or reduce the quantity of CVP water to be delivered to the District as herein provided for the purposes of such investigation, inspection, maintenance, repair, or replacement of any of the CVP facilities or any part thereof necessary for the delivery of water to the District, but so far as feasible the United States will give the District due notice in advance of such temporary discontinuance or reduction, except in case of emergency, in which case no notice need be given; Provided, that the United States shall use its best efforts to avoid any discontinuance or reduction in such service. Upon resumption of service after such reduction or discontinuance, and if requested by the District, the United States will, if possible, deliver the quantity of CVP water which would have been delivered hereinunder in the absence of such discontinuance or reduction.

(c) The United States reserves the right to all waste, seepage, and return-flow water derived from water delivered to the District which escapes or is discharged beyond boundaries of the District's Service Area. Nothing herein shall be construed as claiming for the United States any right, as waste, seepage, or return flow, to water being used pursuant to this contract within the District's Service Area by the District, or those claiming by or through the District.

WATER SHORTAGE AND APPORTIONMENT

12. (a) The United States shall use all reasonable means in its operation and management of the CVP to make full supplies of CVP water specified in this contract available to the District during each Year. If, nevertheless, the United States is unable to make such full supplies available to the District in any Year on account of drought, errors in operation, or other causes which the Contracting Officer has determined are beyond the control of the United States, the District shall hold the United States, its officers, agents and employees harmless from any and all liability and/or damages arising therefrom.

(b) During any Year in which the Contracting Officer determines that the United States will be unable to make full supply of CVP water specified in this contract available to the District, the Contracting Officer shall, to the extent permitted by applicable law and existing contracts, apportion the available CVP water among the water users of the CVP by reducing the quantities of CVP water made available to such users; Provided, that, the percentage reduction applied by the Contracting Officer to the M&I water made available to the District shall be no greater than the percentage reduction applied by the Contracting Officer to any other CVP M&I user, and no reduction shall be made to M&I water made available to the District unless and until reductions have also been imposed on irrigation users receiving water from the integrated Project water supply, irrespective of water allocations as determined by the Contracting Officer made to prevent undue hardship; and Provided further, that in no

Year of shortage shall the Contracting Officer reduce the quantity of M&I water made available to the District by more than 25 percent of the forecast of water requirements within the District Service Area for the upcoming Year. The quantity of CVP water made available to the District shall be determined in accordance with subdivision (c) of this Article.

(c) In order to arrive at the actual quantity of CVP water to be made available to the District during the upcoming Year of shortage, the percentage reduction determined pursuant to subdivision (b) shall be applied to the forecast of water requirements for the Year of shortage as determined in the manner set forth in this subdivision. The Contracting Officer, prior to imposing a water reduction, shall request, in writing, from the District a forecast of water requirements within the District Service Area for the Year of shortage. The District shall prepare and submit said forecast to the Contracting Officer for approval within the time specified in the request. The quantity of CVP water to be made available to the District shall be based on the approved forecast of water requirements within the District's Service Area reduced pursuant to subdivision (b) above. For the purposes of this Article, the term "water requirements within the District Service Area," shall be the average quantity of water put to beneficial use within the District Service Area during the last three Years of water use not affected by water reductions, adjusted for growth, excluding uses that will continue to be satisfied from established recycled water and groundwater service. Nothing in this subdivision shall affect any of the provisions in Article 13.

(d) The quantity of CVP water to be made available to the District pursuant to subdivisions (b) and (c) above, will be reduced by those water supplies listed in Exhibit "C" that are actually used to satisfy a portion of the forecasted water requirements within the District's Service Area during the Year of shortage; and will be further reduced by that quantity of CVP water diverted by the District and stored within Los Vaqueros during prior Years and withdrawn for use within the District Service Area during the Year of shortage.

(e) In addition to the quantity of CVP water made available to the District pursuant to subdivisions (b) and (c) of this article, the Contracting Officer may make additional CVP water available to the District to protect public health and safety. Requests for this additional CVP water will not be considered unless the District has developed a drought contingency water conservation plan, acceptable to the Contracting Officer, and the District is complying with the requirements of this plan. Evaluation of the requests for additional CVP water will consider other sources of water available to the District.

EXISTING OR ACQUIRED WATER OR WATER RIGHTS

13. Except as specifically provided, the provisions of this contract shall not be applicable to or affect water or water rights now owned or hereafter acquired by the District or any user of such water in the District Service Area from other than the United States by the District. In addition, this contract shall not be construed as limiting or curtailing any rights which the District or any water user within the District Service

Area acquires or has available under any other contract pursuant to the Federal reclamation laws.

QUALITY OF WATER

14. In recognition of the importance of water quality to the uses and users of water in the District and the applicable water quality provisions of the Federal reclamation laws, and to assist the District in meeting its Los Vaqueros Project goal of providing high quality water supply to its customers, CVP facilities used to make available and deliver CVP water to the District pursuant to this contract shall be operated and maintained to enable the United States to make available and deliver CVP water to the District in accordance with the water quality standards specified in subsection 2(b) of the Act of August 26, 1937, (50 Stat. 865), as added by Section 101 of the Act of October 27, 1986, (100 Stat. 3050). The United States is under no obligation to construct or furnish water treatment facilities to maintain or to better the quality of CVP water furnished to the District pursuant to this contract. The United States does not warrant the quality of water to be made available and delivered to the District pursuant to this contract.

WATER AND AIR POLLUTION CONTROL

15. The District, in carrying out this contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California, and shall obtain all required permits or licenses from the appropriate Federal, State or local authorities.

OPERATION AND MAINTENANCE OF PROJECT WORKS

16. (a) The District, without expense to the United States, shall O&M the Project Works in full compliance with the Federal reclamation laws and the terms of this contract. The provisions of this article shall be implemented consistent with the Memorandum of Agreement relating to Details of Transfer of Operation and Maintenance of Contra Costa Canal System, dated June 23, 1972, as it now exists or may be amended, in such manner that said Works shall be maintained in a good and efficient condition. The District shall use all proper methods to assure the economical and beneficial use of the water delivered by means of said Works. At any time the Contracting Officer determines the O&M by the District of one or more of the Project Works is insufficient, the United States may take back the O&M of all or any part of such Work(s) and the District hereby agrees to surrender possession of said Work(s). The O&M of such Work(s) so taken back for O&M may shall be retransferred to the District upon the furnishing by the Contracting Officer of a written notice to the District ninety (90) days in advance of the intention to retransfer by the United States. Such retransfer shall not be made until the Project Work(s) has/have been placed in efficient operating condition; Provided, that for Project Works taken back by the United States for O&M, the District shall pay the United States quarterly, in advance, sufficient funds, on the basis of an estimate to be submitted by the Contracting Officer, to finance for the O&M of such works. If the actual O&M costs should exceed the estimated costs, the District shall pay the United States the necessary additional sums of money within sixty

(60) days after receipt of a bill submitted by the Contracting Officer to the District. Any surplus of advances by the District shall be refunded or, at the option of the Contracting Officer, be applied against any obligation of the District under this contract due at that time.

(b) No substantial change in any of the Project Works or installation of District facilities on the lands and rights of way of Project Works shall be made by the District without first obtaining the written consent of the Contracting Officer. The District shall promptly make at its expense any and all repairs or replacements to one or more of the Project Work(s) which the Contracting Officer determines are necessary for the proper O&M of such Work(s). If at any time, in the opinion of the Contracting Officer one or more of the Project Work(s) shall from any cause be in a condition unfit for service, he may order that the water be turned out and shut off from that Project Work(s) until, in his opinion, it/they are put in proper condition for service. If the District neglects or fails to make necessary repairs or replacements, at the option of the Contracting Officer such repairs or replacements may be made by the United States and the cost therefor charged to the District. The District shall repay such costs as a miscellaneous cost pursuant to Article 18 hereof. The District at its own expense shall repair any damage to the Project Works resulting from negligence of its officers, employees, or agents.

(c) From time to time the Contracting Officer, without cost to the District, may make a review of maintenance of the Project Works in order to assist the District in determining the condition of those facilities and the adequacy of the maintenance program. The review may include any or all of the Project Works. A report of each such review, including recommendations, if any, shall be prepared and a copy shall be furnished to the District. If deemed necessary by the Contracting Officer or when requested by the District, an inspection of any of the Project Works and of the District's books and records relating thereto may be made to ascertain whether the requirements of this contract are being satisfactorily performed by the District or to assist the District in solving specific problems. Any such inspection shall, except in a case of emergency, be made after written notice to the District and the actual cost thereof shall be paid by the District to the United States as a miscellaneous cost pursuant to Article 18 hereof. District representatives may participate in either the review or inspection.

(d) The District shall have the right to abandon one or more of the Project Works with the prior written approval of the Contracting Officer; Provided, that abandonment of one or more of the Project Works shall not relieve the District of its obligation to repay the capital cost plus interest as appropriate of such Project Work(s) facilities less any disposal or salvage value which may be realized.

(e) If and when the District fully repays the United States the costs of one or more of the Project Works and the ownership of such Project Works is transferred to the District, the provisions of subdivisions (a), (b), (c), and (d) of this Article and subdivision (a) of Article 17 shall no longer apply to such work(s).

CONVEYANCE OF NON-PROJECT WATER

17. The District may use Project Works to convey non-project water, subject to each of the following conditions:

(a) such conveyance shall not interfere with deliveries of water hereunder;

(b) Non-project water for irrigation use shall be utilized in accordance with the applicable acreage limitation provisions of the Federal reclamation laws;

(c) CVP project use power shall not be used to pump or convey non-project water;

(d) The United States shall not incur any liability or unreimbursed cost or expense thereby;

(e) The quantities of non-project water introduced into and conveyed through the Project Works shall be measured or otherwise determined by the District in a manner consistent with Article 5 of this contract, acceptable to the Contracting Officer and at no cost to the United States;

(f) The rate(s) the District is to pay to the United States for conveying non-project water through Project Works shall be determined annually by the United States in accordance with the applicable provisions of Federal law, including but not limited to

the Warren Act of February 21, 1911 (36 Stat. 935), as amended and supplemented, associated regulations and the then-current applicable Federal ratesetting policies.

DISTRICT TO PAY CERTAIN MISCELLANEOUS COSTS RELATING TO PROJECT WORKS

18. In addition to all other payments to be made by the District under this contact, the District shall repay to the United States, within sixty (60) days after receipt of a bill and detailed statement submitted by the Contracting Officer to the District for such specific items of direct cost incurred by the United States for work associated with this contract normally charged by the United States plus a percentage of such direct costs for administrative and general overhead in accordance with applicable Bureau of Reclamation policy and procedures.

EMERGENCY RESERVE FUND

19. (a) The District shall accumulate and maintain a reserve fund, as set forth in subdivision (b) below, which the District shall keep available to pay O&M costs incurred during periods of special stress caused by damaging droughts, storms, earthquakes, floods, or other emergencies threatening or causing interruption of water service.

(b) The District shall establish a reserve fund of not less than $1,000,000 in a Federally insured interest- or dividend-bearing account, or investments in securities guaranteed by the Federal Government; Provided, that the money so deposited or invested shall be available within a reasonable time to meet expenses for

the purposes identified in subdivision (d) of this Article. Whenever said reserve fund is reduced below one million Dollars by expenditures therefrom, it shall be restored to that amount by accumulation of annual deposits at a minimum of $250,000. The interest earnings shall continue to accumulate and be retained as part of the reserve fund except when required to meet expenditures pursuant to subdivisions (a) and (d) of this Article.

(c) By written agreement between the District and the Contracting Officer, the basic amount of the reserve fund may be adjusted to account for risk and uncertainty stemming from the size and complexity of the Project Works, the size of the District's annual O&M budget and O&M costs not contemplated when this contract was executed.

(d) The District may withdraw money from the reserve fund only for meeting unusual O&M costs incurred during periods of special stress as described in subdivision (a) above, and unforeseen extraordinary O&M costs, unusual or extraordinary repair or replacement costs, and betterment costs (in situations where recurrence of severe problems can be eliminated) during such periods of special stress. The District shall notify the Contracting Officer of any expenditure from the reserve fund pursuant to this subdivision.

TRANSFER OF TITLE TO PROJECT WORKS

20. Upon repayment of the all outstanding capitalized costs of one or more of the Project Works, and upon appropriate authorization by Congress, all rights, title and interest in and to the relevant Project Work(s) shall be transferred to the District.

PERFORMANCE OF WORK WITH CONTRIBUTED FUNDS

21. (a) Pursuant to the Act of March 4, 1921 (41 Stat. 1367, 1404), the Contracting Officer may accept funds contributed by the District to finance any authorized construction work on the CVP facilities not otherwise provided for by this contract for which funds may not be available. Pursuant to the Act of January 12, 1927 (44 Stat. 957, 43 U.S.C. § 397a), the Contracting Officer may also accept funds contributed by the District to finance any authorized operations and maintenance work on the CVP facilities not otherwise provided for by this contract for which funds may not be available. When the undertaking of such work is approved, funds therefor shall be advanced by the District as may be directed by the Contracting Officer and there shall be submitted to the Contracting Officer a certified copy of the resolution of the Board of Directors of the District describing the work to be done and authorizing its performance with contributed funds.

(b) After completion of any work so undertaken the District shall be furnished with a statement of the final cost thereof and any unexpended balance of funds shall be refunded to the District or applied as otherwise directed by the District, and the amount by which the cost of such work exceeds the amount of the funds advanced by the

District therefor shall be paid by the District to the United States as the Contracting Officer may direct.

GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

22. (a) The obligation of the District to pay the United States as provided in this contract is a general obligation of the District notwithstanding the manner in which the obligation may be distributed among the District's water users and notwithstanding the default of individual water users in their obligations to the District.

(b) The payment of charges becoming due hereunder is a condition precedent to receiving benefits under this contract. The United States shall not make water available to the District through CVP facilities during any period in which the District may be in arrears in the advance payment of water rates due the United States or in arrears for more than 12 months in the payment of any construction charges due the United States. The District shall not furnish water made available pursuant to this contract for lands or parties which are in arrears in the advance payment of water rates or in arrears more than 12 months in the payment of construction charges as levied or established by the District.

COMPLIANCE WITH RECLAMATION LAWS

23. The parties agree that the delivery of irrigation water or the use of the federal facilities pursuant to this contract is subject to Reclamation law, as amended and supplemented, including, but not limited to, the Reclamation Reform Act of 1982 (96 Stat. 1263; 43 U.S.C. § 390aa, et seq).

BOOKS, RECORDS AND REPORTS

24. The District shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this contract, including: the District's financial transactions, water supply data, CVP operation, maintenance and replacement logs, and CVP land and right-of-way use agreements; the water users' land-use (crop census), landownership, land-leasing and water-use data; and other matters that the Contracting Officer may require. Reports thereon shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this contract shall have the right during office hours to examine and make copies of the other party's books and records relative to matters covered by this contract.

CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

25. The expenditure or advance of any money or the performance of any obligation of the United States under this contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the District from any obligations under this contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

RULES, REGULATIONS AND DETERMINATIONS

26. (a) The parties agree that the delivery of water or the use of Federal facilities pursuant to this contract is subject to Reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Reclamation law; Provided, that nothing herein shall be construed as a waiver, by the District, to contest any modification in such rules and regulations, and of the right to seek just compensation for the taking of any rights granted under this contract.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this contract that are consistent with the expressed and implied provisions of this contract, the laws of the United States and the State, and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the District.

OFFICIALS NOT TO BENEFIT

27. No member of, or delegate to Congress, Resident Commissioner, or official of the District shall benefit from this contract other than as a water user or landowner in the same manner as other water users or landowners.

NOTICES

28. Any notice, demand, or request authorized or required by this contract shall be deemed to have been given, on behalf of the District, when mailed, postage prepaid, or delivered to the Regional Director, Mid-Pacific Region, Bureau of Reclamation, 2800 Cottage Way, Sacramento, California 95825-1898, and on behalf of the United States, when mailed, postage prepaid, or delivered to the Board of Directors of the Contra Costa Water District, PO Box H20, Concord CA 94524. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this article for other notices.

ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

29. The provisions of this contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this contract or any right or interest therein shall be valid until approved in writing by the Contracting Officer.

EQUAL OPPORTUNITY

30. During the performance of this contract, the District agrees as follows:

(1) The District will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The District will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The District agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(2) The District will, in all solicitations or advertisements for employees placed by or on behalf of the District, state that all qualified applicants will receive consideration for employment without discrimination because of race, color, religion, sex, or national origin.

(3) The District will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the said labor union or workers' representative of the District's commitments under

Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The District will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The District will furnish all information and reports required by said amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the District's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be cancelled, terminated, or suspended, in whole or in part, and the District may be declared ineligible for further government contracts in accordance with procedures authorized in said amended Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The District will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such provisions will be binding upon each subcontractor or vendor. The District will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the District becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the District may request the United States to enter into such litigation to protect the interests of the United States.

CHARGES FOR DELINQUENT PAYMENTS

31. (a) The District shall be subject to interest, administrative and penalty charges on delinquent installments or payments. When a payment is not received by the due date, the District shall pay an interest charge for each day the payment is delinquent beyond the due date. When a payment becomes 60 days delinquent, the District shall pay

an administrative charge to cover additional costs of billing and processing the delinquent payment. When a payment is delinquent 90 days or more, the District shall pay an additional penalty charge of six percent (6%) per year for each day the payment is delinquent beyond the due date. Further, the District shall pay any fees incurred for debt collection services associated with a delinquent payment.

(b) The interest charge rate shall be the greater of the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of one-half percent (0.5%) per month prescribed by Section 6 of the Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due date and remain fixed for the duration of the delinquent period.

(c) When a partial payment on a delinquent account is received, the amount received shall be applied, first to the penalty, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

32. (a) The District shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the Age Discrimination Act of 1975 (42 U.S.C. § 6101, et seq.) and any other applicable civil rights laws, as well as with their respective implementing regulations and guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

(b) These statutes require that no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation. By executing this contract, the District agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(c) The District makes this agreement in consideration of and for the purpose of obtaining any and all federal grants, loans, contract, property discounts or other federal financial assistance extended after the date hereof to the District by the Bureau of Reclamation, including installment payments after such date on account of arrangement for federal financial assistance which were approved before such date. The District recognizes and agrees that such federal assistance will be extended in reliance on the representations and agreements made in this article, and that the United States reserves the right to seek judicial enforcement thereof.

PRIVACY ACT COMPLIANCE

33. (a) The District shall comply with the Privacy Act of 1974 (5 U.S.C. § 552a) (the Act) and the Department of the Interior rules and regulations under the Act (43 C.F.R. 2.45 et seq.) in maintaining landholder acreage certification and reporting records, required to be submitted to the District for compliance with sections 206 and 228 of the Reclamation Reform Act of 1982 (96 Stat. 1266), and pursuant to 43 C.F.R. 426.10.

(b) With respect to the application and administration of the criminal penalty provisions of the Act (5 U.S.C. § 552a(i)), the District and the Districts employees responsible for maintaining the certification and reporting records referenced in (a) above are considered to be employees of the Department of the Interior. See 5 U.S.C. § 552a(m).

(c) The Contracting Officer or a designated representative shall provide the District with current copies of the Interior Department Privacy Act regulations and the Bureau of Reclamation Federal Register Privacy Act System of Records Notice (Acreage Limitation--Interior, Reclamation-31) which govern the maintenance, safeguarding, and disclosure of information contained in the landholders certification and reporting records.

(d) The Contracting Officer shall designate a full-time employee of the Bureau of Reclamation to be the System Manager who shall be responsible for making decisions on denials pursuant to 43 C.F.R. 2.61 and 2.64 amendment requests pursuant to 43 C.F.R. 2.72. The District is authorized to grant requests by individuals for access to their own records.

(e) The District shall forward promptly to the System Manager each proposed denial of access under 43 C.F.R. 2.64, and each request for amendment of records filed under 43 C.F.R. 2.71; notify the requester accordingly of such referral; and provide the System Manager with information and records necessary to prepare an appropriate response to the requester. These requirements do not apply to individuals seeking access to their own certification and reporting forms filed with the District pursuant to 43 C.F.R. $ 426.10 unless the requestor elects to cite the Privacy Act as a basis for the request.

CONFIRMATION OF CONTRACT

34. The District, after the execution of this contract, shall promptly seek to secure a decree of a court of competent jurisdiction of the State of California, confirming the execution of this contract. The District shall furnish the United States a certified copy of the final decree, the validation proceedings, and all pertinent supporting records of the court approving and confirming this contract, and decreeing and adjudging it to be lawful, valid, and binding on the District. This contract shall not be binding on the United States until such final decree has been secured.

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WATER CONSERVATION

35. The District shall develop an effective water conservation program acceptable to the Contracting Officer. The water conservation program shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives. At subsequent 6-Year intervals, the District shall submit a report on the results of the program to the Contracting Officer for review. Based on the conclusions of the review, the Contracting Officer and District shall consult and agree to continue or to revise the existing water conservation program.

CHANGES IN DISTRICT'S ORGANIZATION

36. While this contract is in effect, no change may be made in the District's organization, by inclusion or exclusion of lands, dissolution, consolidation, merger or otherwise, except upon the Contracting Officer's written consent. Such consent is required to ensure that the District retains its capacity to perform the obligations and make the payments set forth herein and to ensure compliance with the applicable provisions of Federal reclamation laws including but not limited to Section 8 of the Act of June 17, 1902 (32 Stat. 390; 43 U.S.C. §§ 372, 383) and the Reclamation Reform Act of October 12, 1982 (96 Stat. 1263; 43 U.S.C. § 390aa, et seq.)

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first hereinabove written.

THE UNITED STATES OF AMERICA

By_____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

CONTRA COSTA COUNTY WATER DISTRICT

(SEAL)

By_____
President

Attest:

_____
Secretary
jdccwd.con

EXHIBIT A

1992 Water Rates Per Acre-Foot (rounded) for Amendatory
Contract No. I75r-3401 Contra Costa Water District

	Central Valley Project		Los Vaqueros Water
	IRRIGATION	M&I	M&I
O&M Rate:			
Water Marketing	$0.66	$0.94	$0.94
Storage	3.73	3.60	N/A
Conveyance			N/A
Conveyance Pumping			N/A
Direct Pumping	1.13	1.13	1.13
San Luis Drain			N/A
Total O&M Rate	$5.52	$5.67	$2.07
Capital Components			
Deferred Interest		$1.78	N/A
Storage	$2.37	5.92	N/A
Conveyance			N/A
Conveyance Pumping			N/A
Direct Pumping	0.30	0.65	$0.65
San Luis Drain			N/A
Total Capital Rate	$2.67	$8.35	$0.65
Deficit Rate:			
Non-Interest Bearing	$19.60		N/A
Interest Bearing	0.34	$6.15	N/A
Total Deficit Rate	$19.94	$6.15	
Cost of Service Rate	$28.14	$20.17	$2.72
M&I Surcharge	N/A	*	N/A
1992 water rates	$28.14	*	$2.72
Full Cost Rates as defined in Reclamation Reform Act (96 Stat. 1263)			
202(3)	$34.89	N/A	N/A
205(a)(3)	$41.00	N/A	N/A

* To be determined by the Contracting Officer prior to the effective date of this amendatory contract

EXHIBIT B
PAGE 1 OF 3

R.O. Draft 6/26-1992

CONTRA COSTA WATER DISTRICT FACILITIES REPAYMENT SCHEDULE
FOR CONTRA COSTA CANAL
AMENDATORY CONTRACT NO. I75r-3401

PAYMENT DATE	BEGINNING BALANCE	INTEREST RATE	INTEREST DUE	PRINCIPLE DUE	TOTAL DUE
JAN 1, 1993	$2,581,535.34	2.50000%	$0.00	$175,469.05	$175,469.05
JAN 1, 1994	2,406,066.29	2.50000%	60,151.66	115,317.39	175,469.05
JAN 1, 1995	2,290,748.90	2.50000%	57,268.72	118,200.33	175,469.05
JAN 1, 1996	2,172,548.57	2.50000%	54,313.71	121,155.34	175,469.05
JAN 1, 1997	2,051,393.23	2.50000%	51,284.83	124,184.22	175,469.05
JAN 1, 1998	1,927,209.01	2.50000%	48,180.23	127,288.82	175,469.05
JAN 1, 1999	1,799,920.19	2.50000%	44,998.00	130,471.05	175,469.05
JAN 1, 2000	1,669,449.14	2.50000%	41,736.23	133,732.82	175,469.05
JAN 1, 2001	1,535,716.32	2.50000%	38,392.91	137,076.14	175,469.05
JAN 1, 2002	1,398,640.18	2.50000%	34,966.00	140,503.05	175,469.05
JAN 1, 2003	1,258,137.13	2.50000%	31,453.43	144,015.62	175,469.05
JAN 1, 2004	1,114,121.51	2.50000%	27,853.04	147,616.01	175,469.05
JAN 1, 2005	966,505.50	2.50000%	24,162.64	151,306.41	175,469.05
JAN 1, 2006	815,199.09	2.50000%	20,379.98	155,089.07	175,469.05
JAN 1, 2007	660,110.02	2.50000%	16,502.75	158,966.30	175,469.05
JAN 1, 2008	501,143.72	2.50000%	12,528.59	162,940.46	175,469.05
JAN 1, 2009	338,203.26	2.50000%	8,455.08	167,013.97	175,469.05
JAN 1, 2010	171,189.29	2.50000%	4,279.73	171,189.32	175,469.05
	TOTAL		$576,907.53	$2,581,535.37	$3,158,442.90

CONTRA COSTA WATER DISTRICT FACILITIES REPAYMENT SCHEDULE
FOR CONTRA LOMA DAM AND RESERVOIR
AMENDATORY CONTRACT NO. I75r-3401

PAYMENT DATE	BEGINNING BALANCE	INTEREST RATE	INTEREST DUE	PRINCIPLE DUE	TOTAL DUE
JAN 1, 1993	$4,393,558.33	3.13700%	$0.00	$313,332.19	$313,332.19
JAN 1, 1994	4,080,226.14	3.13700%	127,996.69	185,335.50	313,332.19
JAN 1, 1995	3,894,890.64	3.13700%	122,182.72	191,149.47	313,332.19
JAN 1, 1996	3,703,741.17	3.13700%	116,186.36	197,145.83	313,332.19
JAN 1, 1997	3,506,595.34	3.13700%	110,001.90	203,330.29	313,332.19
JAN 1, 1998	3,303,265.05	3.13700%	103,623.42	209,708.77	313,332.19
JAN 1, 1999	3,093,556.28	3.13700%	97,044.86	216,287.33	313,332.19
JAN 1, 2000	2,877,268.95	3.13700%	90,259.93	223,072.26	313,332.19
JAN 1, 2001	2,654,196.69	3.13700%	83,262.15	230,070.04	313,332.19
JAN 1, 2002	2,424,126.65	3.13700%	76,044.85	237,287.34	313,332.19
JAN 1, 2003	2,186,839.31	3.13700%	68,601.15	244,731.04	313,332.19
JAN 1, 2004	1,942,108.27	3.13700%	60,923.94	252,408.25	313,332.19
JAN 1, 2005	1,689,700.02	3.13700%	53,005.89	260,326.30	313,332.19
JAN 1, 2006	1,429,373.72	3.13700%	44,839.45	268,492.74	313,332.19
JAN 1, 2007	1,160,880.98	3.13700%	36,416.84	276,915.35	313,332.19
JAN 1, 2008	883,965.63	3.13700%	27,730.00	285,602.19	313,332.19
JAN 1, 2009	598,363.44	3.13700%	18,770.66	294,561.53	313,332.19
JAN 1, 2010	303,801.91	3.13700%	9,530.27	303,801.92	313,332.19
	TOTAL		$1,246,421.08	$4,393,558.34	$5,639,979.42

CONTRA COSTA WATER DISTRICT FACILITIES REPAYMENT SCHEDULE
FOR NEW FACILITIES
AMENDATORY CONTRACT NO. I75r- 3401

PAYMENT DATE	BEGINNING BALANCE	INTEREST RATE	INTEREST DUE	PRINCIPLE DUE	TOTAL DUE
JAN 1, 1993	$3,787,414.66	3.34200%	$0.00	$274,236.73	$274,236.73
JAN 1, 1994	3,513,177.93	3.34200%	117,410.41	156,826.32	274,236.73
JAN 1, 1995	3,356,351.61	3.34200%	112,169.27	162,067.46	274,236.73
JAN 1, 1996	3,194,284.15	3.34200%	106,752.98	167,483.75	274,236.73
JAN 1, 1997	3,026,800.40	3.34200%	101,155.67	173,081.06	274,236.73
JAN 1, 1998	2,853,719.34	3.34200%	95,371.30	178,865.43	274,236.73
JAN 1, 1999	2,674,853.91	3.34200%	89,393.62	184,843.11	274,236.73
JAN 1, 2000	2,490,010.80	3.34200%	83,216.16	191,020.57	274,236.73
JAN 1, 2001	2,298,990.23	3.34200%	76,832.25	197,404.48	274,236.73
JAN 1, 2002	2,101,585.75	3.34200%	70,235.00	204,001.73	274,236.73
JAN 1, 2003	1,897,584.02	3.34200%	63,417.26	210,819.47	274,236.73
JAN 1, 2004	1,686,764.55	3.34200%	56,371.67	217,865.06	274,236.73
JAN 1, 2005	1,468,899.49	3.34200%	49,090.62	225,146.11	274,236.73
JAN 1, 2006	1,243,753.38	3.34200%	41,566.24	232,670.49	274,236.73
JAN 1, 2007	1,011,082.89	3.34200%	33,790.39	240,446.34	274,236.73
JAN 1, 2008	770,636.55	3.34200%	25,754.67	248,482.06	274,236.73
JAN 1, 2009	522,154.49	3.34200%	17,450.40	256,786.33	274,236.73
JAN 1, 2010	265,368.16	3.34200%	8,868.60	265,368.13	274,236.73
	TOTAL		$1,148,846.51	$3,787,414.63	$4,936,261.14

EXHIBIT C

CONTRA COSTA WATER DISTRICT AMENDATORY CONTRACT I75r-3401

WATER SUPPLIES FOR WHICH THE ACTUAL AVAILABILITY WILL BE DEDUCTED FROM CVP WATER ALLOCATION TO THE DISTRICT IN YEARS OF SHORTAGE, PURSUANT TO ARTICLE 12, SUBDIVISION (d)

Water Right Holder	Water Right Application No.
City of Antioch	S 9352
Contra Costa Water District	A 5941 (P 3167, L 10514)
	A 27893 (P 19856)
Gaylord Container	A 17001 (P 19418)

Note: S = Statement of Use

Attachment 2. Effects of Revised Project Operations on Delta Diversions

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Description of Additional Operations Studies

In response to reviewer's comments on the Los Vaqueros Project Draft Stage 2 EIR/EIS, CCWD has examined the project for a variety of current and potential water quality and flow standards. The operation studies have also been extended to incorporate the new 70-year hydrology (1922-1991).

Since publication of the Draft Stage 2 EIR/EIS, the California State Water Resources Control Board has introduced a new approach for setting water quality and flow standards. Draft Decision 1630 water quality standards were not implemented by the SWRCB. However, under the Endangered Species Act, the National Marine Fisheries Service (NMFS) has issued a CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the United States Fish and Wildlife Service (USFWS) has issued a CVP-OCAP Biological Opinion on Delta Smelt (May 26, 1993). The United States Environmental Protection Agency (EPA) has also proposed standards based on the location of the 2 ppt bottom salinity.

NMFS has also issued a Los Vaqueros Project Biological Opinion for winter run salmon (March 18, 1993). Additionally, the US Fish and Wildlife Service has issued a Biological Opinion on Los Vaqueros Project operations for Delta smelt (September 9, 1993).

The operation study results presented in this Attachment reflect Central Valley flows and Delta salinities for two different cases:

(1) SWRCB Decision 1485,
(2) D-1485 with both the NMFS CVP-OCAP biological opinion for winter run salmon (February 12, 1993) and conditions based on the 1993 USFWS CVP-OCAP biological opinion for Delta smelt (May 26, 1993).

In both cases, operation of the Los Vaqueros project was based upon operations rules from:

(a) NMFS LVP biological opinion for winter run salmon (March 18, 1993),
(b) USFWS LVP biological opinion for Delta smelt (September 9, 1993).

Limited analyses of the operation of the Los Vaqueros Project under Draft D-1630 were also carried out. However, the NMFS CVP-OCAP biological opinion and USFWS 1993 CVP-OCAP biological opinion both incorporated major features from SWRCB Draft D-1630, in particular limitations on QWEST for November through August. Results from the Draft D-1630 analyses are similar to those for D1485+NMFS+USFWS CVP-OCAP BO.

The following operation rules were used in the Los Vaqueros Operation studies reported in this attachment:

(1) Existing CCWD demands: 117.6 TAF in non-critical years, 130.7 TAF in critical years. (Source: Montgomery-Watson, Consulting Engineers).
(2) Limited CCWD direct diversion in April. In April, CCWD service area demands were satisfied by releases from the Los Vaqueros Reservoir, provided emergency storage requirements were still met.
(3) No diversions to storage March 15 through May 31 (NMFS LVP BO on winter run salmon and USFWS LVP BO on Delta smelt).
(4) The reservoir was not filled if the chloride concentration at the proposed Old River intake exceeded 50 mg/l chloride.
(5) The reservoir can be filled September through December without restriction. The reservoir can be filled January and June through August if the 2 ppt isohaline was at or west of Collinsville. The reservoir can be filled February through March 15 if the 2 ppt isohaline was at or west of Chipps Island.
(6) One source of filling water was Los Vaqueros Water Right 20245 water (only available November through June when surplus flow is available, but further restricted by rule (3) above. according to NMFS Los Vaqueros Project Biological Opinion on Winter Run Salmon). The other source is CVP rediversion water. As per rule (4) above, this was assumed available without restriction September through December. However, for January through March 14, and June through August, availability of CVP rediversion water was assumed to be restricted when the CVP was making releases or limiting exports to meet the requirements of the CVP-OCAP biological (for example, limitations on QWEST).
(7) Total CCWD diversions of CVP water from the Delta were limited to 195 TAF, March through February.
(8) Water qualities at the existing Rock Slough intake and proposed Old River intake were based on monthly averages from Fischer Delta model simulations (fixed chloride operation studies).

The operation studies show that, regardless of hydrologic period and water quality and flow standards, the project does not result in significant net increases in CCWD diversions from the Delta and the diversions in any one year do not deviate significantly from the average diversions. Increases in diversions generally occur in wet years following dry years, and decreased diversions are common in dry years. Under D-1485, most of the reservoir filling would occur in June, July and August. Under D1485+NMFS+USFWS CVP-OCAP BO, the QWEST limitations for June, July and August limit the availability of CVP rediversion water. The main filling period shifts away from Spring into the Fall. It is important to remember that in all cases, Los Vaqueros Reservoir filling only occurs when

the Delta inflows and outflows are large enough to produce good quality water at the Old River intake (50 mg/l chlorides).

The operations studies again show that the project effects on Delta outflows, reverse flows (negative QWEST) and total Delta exports are very small, regardless of the assumptions on hydrology and Delta standards. The operations studies also suggest that, the shift in timing of diversions with the Los Vaqueros Project may result in a small increase in the average CVP end-of-month reservoir storage from November through August.

Note that under D-1485, the limited CCWD Delta diversions in April (average of 0.9 TAF with the project) are reflected in a net decrease in total Delta diversions in April (average of -5 TAF). However, under the current NMFS and USFWS OCAP biological opinions, the CVP and SWP would likely conduct operations as closely as possible within their QWEST limitations. In the present operations studies, April was chosen to represent the 30-day period when releases are made from the Los Vaqueros Reservoir releases and all CCWD Delta diversions cease. The current CVP-OCAP biological opinions require a minimum QWEST of 0 cfs in April. The present operation studies with D1485+NMFS+USFWS OCAP BO standards in the Delta, indicate that the QWEST restriction is the limiting factor so increased pumping at the Tracy pumping plant offsets the April reductions in CCWD diversions and that there is often no net decrease in total Delta diversions.

The change in project diversions (limited to 200 cfs) do not have a significant effect on Chipps Island salinity.

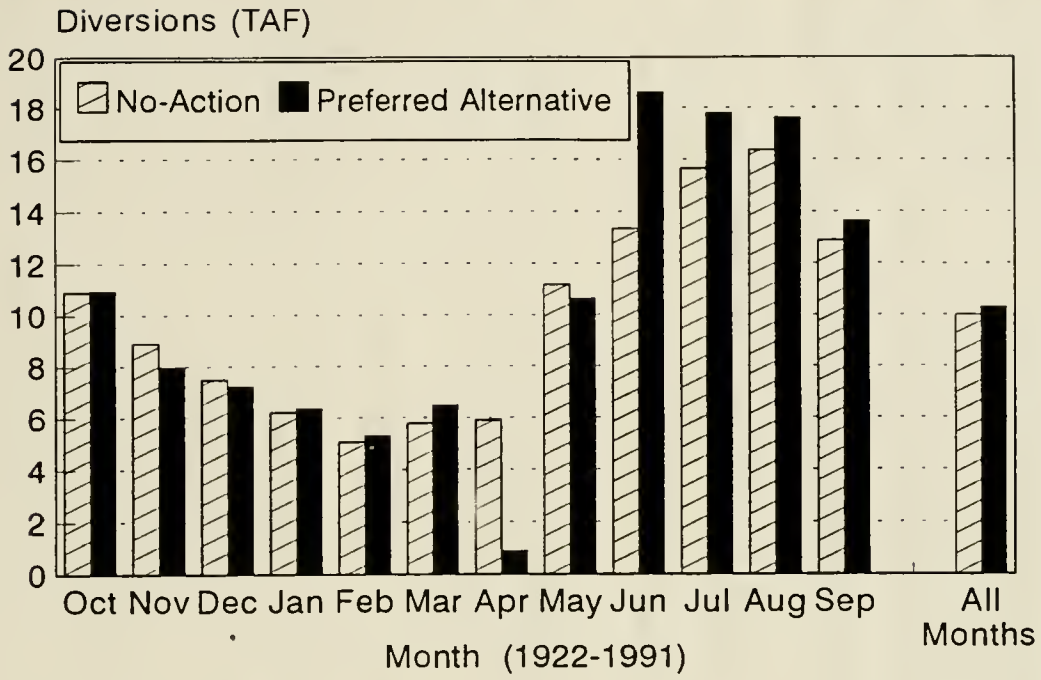
The operations studies suggest that with the preferred alternative, the Contra Costa Water District will be able to meet its delivered water quality goal of 65 mg/l more than 94% of the time compared to only 65% without the project. The operations studies also suggest that with the preferred alternative, the District would be able to stop all Delta diversions in April, 83% of the time.

Adding current hydrology to the sequence (1979-1991) changes the sample statistics slightly, but does not alter the conclusions. These results demonstrate that, regardless of assumptions concerning Delta standards and the length of the hydrologic record, the Los Vaqueros Project has virtually no effect on Delta flows and salinity, and that the conclusions based upon the earlier studies are unchanged. The average Sacramento 4-River index for 1922-1978 (17.1 MAF) is almost the same as the 1922-1991 average (17.2 MAF). From 1922 to 1937, runoff from the Sacramento River basin tended to be below average, but this was compensated by a net above average Sacramento River basin runoff from 1938 to 1978. From 1979 to 1986, there was a net above average runoff but this was compensated by the net below average runoff during the drought period 1987-1991.

The final table in this attachment is a comparison of the Chipps Island salinities from one of the operations studies with the proposed EPA 2 ppt isohaline standards. The operation study chosen for this comparison assumes D1485 with the NMFS and USFWS CVP-OCAP biological opinions (i.e. QWEST standards in place) but does not specifically attempt to meet EPA's proposed 2 ppt bottom isohaline standards at Roe Island, Chipps Island or Collinsville. The operation study suggests that with the existing water quality and flow standards, the CVP and SWP should be able to meet the 2ppt standard at Chipps Island during wet, above normal and most below normal years without additional releases. However, the standard would not be met in most dry and critical years without either additional releases or reductions in exports. Note that this analysis is based on monthly-averaged flows and salinities, so individual days of compliance within a given month could not be determined.

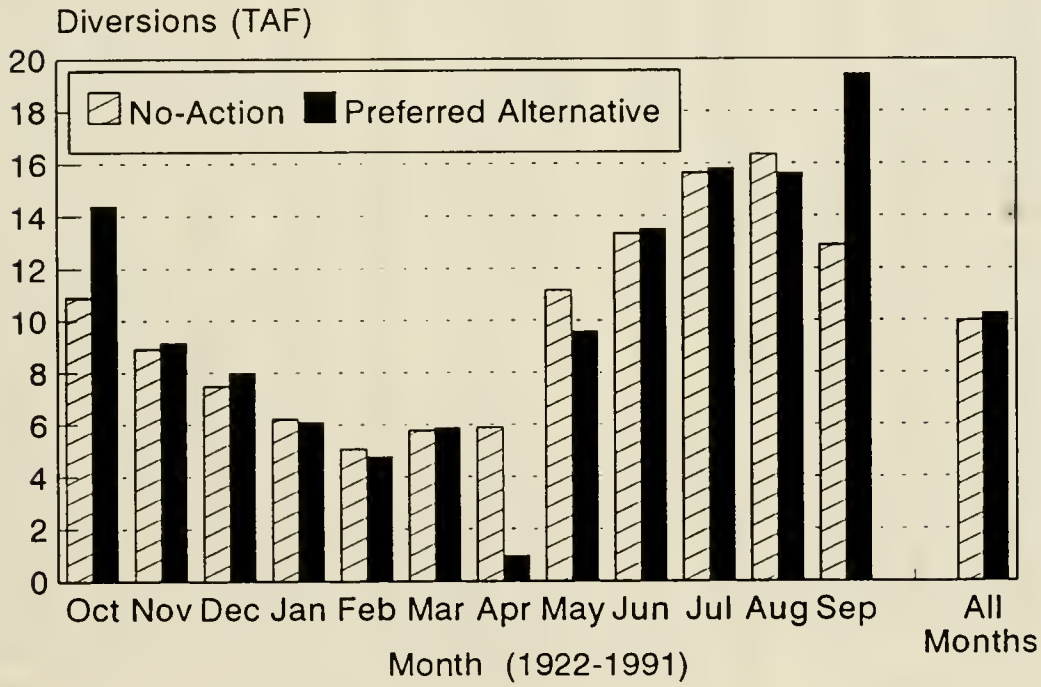
The USFWS Los Vaqueros biological opinion on Delta Smelt (September 9, 1993) limits filling of the Los Vaqueros Reservoir based on the location of the 2ppt bottom isohaline at Chipps Island and Collinsville. This will further ensure that the Project will not adversely affect the designated beneficial uses of the Bay/Delta estuary.

CCWD Delta Diversions
Existing Demands, D-1485



CCWD gds 08/31/93

CCWD Delta Diversions
Existing Demands, D-1485+NMFS+USFWS OCAP BO



CCWD gds 08/31/93

CCWD Delta Diversions (TAF) 100BH
Existing Level of Demand, No-Action; D-1485

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1923	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1924	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1925	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1926	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1927	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1928	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1929	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1930	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1931	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1932	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1933	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1934	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1935	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1936	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1937	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1938	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1939	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1940	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1941	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1942	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1943	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1944	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1945	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1946	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1947	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1948	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1949	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1950	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1951	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1952	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1953	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1954	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1955	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1956	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1957	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1958	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1959	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1960	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1961	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1962	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1963	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1964	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1965	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1966	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1967	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1968	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1969	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1970	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1971	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1972	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1973	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1974	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1975	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1976	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1977	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1978	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1979	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1980	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1981	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1982	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1983	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1984	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1985	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1986	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1987	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1988	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1989	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1990	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1991	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
AVG	10.90	8.91	7.49	6.22	5.06	5.79	5.90	11.17	13.34	15.65	16.36	12.90	119.82

Difference in CCWD Delta Diversions (TAF)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485 100BW-100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	0	-2.24	-0.86	12.04	-1.13	6.16	-5.33	0	3.90	12.30	1.69	1.32	27.85
1923	0.53	0	0	0	0.02	0	-5.33	0	7.26	1.02	1.03	0.81	5.34
1924	0.53	0	-1.21	0	0	0	-8.68	-6.01	-4.05	-9.52	-9.90	-11.50	-50.34
1925	-0.29	0	0	-0.03	-0.12	6.16	0	0	11.90	12.30	12.30	11.90	54.12
1926	0	-1.01	-1.67	0	8.07	0	-5.33	0	7.11	1.02	1.03	0	9.22
1927	0	0	1.22	0	0	0	-5.33	0	7.12	1.00	1.03	0.84	5.88
1928	0.47	0.11	0	0	0	0	-5.33	0	7.08	1.02	1.03	0.84	5.22
1929	0.58	-1.20	-2.13	0	0	0	-8.68	0	-0.63	-6.54	-5.04	-8.24	-31.88
1930	-9.28	-7.71	-1.46	-0.19	11.11	6.16	0	0	11.90	12.30	12.30	6.05	41.18
1931	0	-1.08	-1.36	-1.32	0	0	-8.68	-2.31	-3.66	-6.03	-8.67	-10.67	-43.78
1932	-6.95	0	-0.42	11.60	0	0	0	0	11.90	12.30	0	0	28.43
1933	-4.02	-2.90	0	-0.22	0	0	-8.68	-1.51	-3.09	-7.24	-2.90	0	-30.56
1934	0	0	0	0	0	0	0	0	0	0	0	0	0
1935	0	0	0	0	0	0	0	0	11.90	12.30	12.30	11.90	48.40
1936	12.30	0	-0.98	0	-1.39	4.15	-5.33	0	7.07	0	1.53	1.31	18.66
1937	0.53	0	-1.02	0	-1.44	-2.58	-5.33	0	9.10	1.02	1.03	0.84	2.15
1938	0	-1.60	2.29	0	-1.61	0	-5.33	0	6.99	1.02	1.03	0.83	3.62
1939	0.52	0.24	0.07	0	0	0	-8.68	0	0	-4.71	-3.37	-0.61	-16.54
1940	-3.04	-2.12	-1.74	-2.34	-3.38	0	0	0	11.90	12.30	12.30	0.87	24.75
1941	0.54	0	0	-1.48	-2.41	-0.36	-5.33	0	5.91	1.02	1.03	0.84	-0.24
1942	0.53	0.19	0.02	0	0	0	-5.33	0	6.57	1.02	1.03	0.84	4.87
1943	0.55	0.19	0	0	0	0	-5.33	0	7.00	1.02	1.03	0.84	5.30
1944	0.57	0	-0.32	0	0	0	-5.33	0	7.25	1.01	1.03	0	4.21
1945	-0.97	-3.14	5.49	0	0	0	-5.33	0	7.18	1.02	1.03	0.84	6.14
1946	0	0	0.62	0	0.04	0.04	-5.33	0	7.35	1.02	1.03	0.84	5.61
1947	0.57	-2.77	-1.06	3.83	0	0.03	-5.33	0	7.31	1.00	1.03	0	4.61
1948	-0.62	-2.91	-2.39	-0.67	0	0	-5.33	0	11.90	3.59	1.09	1.32	5.98
1949	0.54	0	-1.56	0	0	1.66	-5.33	0	7.20	1.02	1.02	0	4.55
1950	0	-1.98	-2.48	-2.60	8.30	0	-5.33	0	7.35	1.02	1.03	0.82	6.13
1951	0.46	0.12	0	0	0	0	-5.33	0	7.19	1.02	1.03	0.84	5.33
1952	0.52	0	0.09	-1.86	0.68	0	-5.33	0	6.97	1.02	1.03	0.84	3.96
1953	0.58	0.22	0	0	0.10	0.10	-5.33	-5.50	0.20	12.30	1.65	1.32	5.64
1954	0.57	0.26	0.05	0	0	0	-5.33	0	7.15	1.01	1.03	0.84	5.59
1955	0.58	0	0.19	0	0	0	-5.33	0	7.33	1.02	1.03	0	4.82
1956	0	-2.25	0	-3.80	-0.28	5.11	-5.33	0	0	8.14	1.02	0.79	3.40
1957	0.46	0.29	0.18	0.05	0	0	-5.33	0	6.79	1.08	1.08	0.80	5.40
1958	0.36	0.18	0.12	0	-3.06	-3.58	-5.33	0	6.26	0	1.41	1.42	-2.22
1959	0.65	0.39	0.15	0.03	0	0	-5.33	-5.50	0.80	12.30	1.82	0	5.31
1960	0	0	-2.06	0	0	3.83	-5.33	0	7.47	1.13	1.06	0.82	6.92
1961	0	-3.10	-0.86	0	4.37	0.07	-5.33	-5.50	0.17	12.30	1.69	0	3.81
1962	0	-3.87	-2.47	0	-2.43	6.16	-5.33	0	10.02	0	1.44	1.19	4.71
1963	0.28	0.06	0.06	0	0	0	-5.33	0	5.90	0	1.50	1.11	3.58
1964	0.35	0	0	0	0	0	-5.33	0	7.88	0	1.43	0	4.33
1965	0	-2.79	4.57	0	0	0	-5.33	0	-0.85	8.56	0	1.68	5.84
1966	0.54	0.20	0	0	0	0	-5.33	0	7.53	0	1.41	1.31	5.66
1967	0.56	-1.01	0.86	-2.35	0	0	-5.33	0	5.43	0	1.38	1.30	0.84
1968	0.56	0.26	0.05	0	0	0	-5.33	0	7.27	1.09	0	1.79	5.70
1969	0.57	-1.04	1.08	-1.26	0	0	-5.33	0	7.01	0	2.00	0.81	3.84
1970	0.50	0.22	0.04	-3.17	-1.38	2.77	-5.33	0	7.47	0	1.49	1.33	3.94
1971	0.57	0	0	0	0.05	0.05	-5.33	0	-0.85	8.76	1.05	0.88	5.18
1972	0.59	0.31	0.10	0	0.02	0.02	-5.33	0	7.58	0	1.52	1.27	6.08
1973	0.33	0	0	0	-2.33	0.68	-5.33	0	7.29	0	1.51	1.34	3.49
1974	0.47	0.10	0	0	0.04	0.04	-5.33	0	-0.85	8.87	1.05	0.94	5.33
1975	0.65	0.29	0.05	0.02	0	0	-5.33	0	7.06	0	1.46	1.21	5.41
1976	0.42	0.21	0.17	0.14	0	0	-8.68	-6.01	-1.10	-8.39	-3.95	-1.95	-29.14
1977	-8.00	-7.49	-4.59	0	0	0	0	0	0	0	0	0	-20.09
1978	0	0	0	0	0	0	0	0	0	12.30	12.30	11.90	36.50
1979	12.30	0	0	-1.26	-1.69	6.16	-5.33	0	11.90	1.48	1.12	0	24.68
1980	0	0	1.95	0	0	0	-5.33	0	0	7.71	1.01	0.81	6.15
1981	0.54	0.33	0.12	0	0.05	0.05	-5.33	0	7.46	1.25	1.11	0	5.58
1982	0	0	1.10	0	0	-1.88	-5.33	0	7.74	0.95	1.01	0.76	4.35
1983	0.40	0	0	0	0	0	-5.33	0	5.91	1.06	1.09	0.89	4.02
1984	0.55	-1.75	1.35	0	0	0	-5.33	0	7.87	1.13	1.13	1.01	5.96
1985	0.67	0.18	0	0	0.05	0.05	-5.33	0	7.52	1.17	1.12	0	5.43
1986	0	-3.57	0	4.96	-3.64	2.04	-5.33	0	6.96	0	1.53	1.21	4.16
1987	0.54	0.50	0	0	0	0.08	-8.68	-6.01	-1.82	-3.65	0	0	-19.04
1988	-3.98	-4.69	-2.60	0	11.11	0	-8.68	0	-0.79	-10.31	-5.98	-1.10	-27.02
1989	0	0	0	0	0	6.15	0	0	11.90	12.30	12.30	11.90	54.55
1990	6.23	0	0	0.38	0	0	-8.68	0	0	-4.07	-4.33	-9.29	-19.76
1991	-9.50	-7.70	-6.78	0	0	-0.03	-0.15	0	0	0	0	0	-24.16
AVG	0.06	-0.93	-0.26	0.15	0.25	0.70	-5.00	-0.55	5.29	2.14	1.28	0.75	3.90

CCWD Delta Diversions (TAF)
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS OCAP BO

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YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1923	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1924	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1925	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1926	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1927	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1928	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1929	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1930	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1931	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1932	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1933	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1934	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1935	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1936	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1937	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1938	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1939	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1940	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1941	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1942	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1943	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1944	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1945	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1946	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1947	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1948	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1949	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1950	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1951	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1952	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1953	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1954	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1955	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1956	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1957	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1958	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1959	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1960	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1961	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1962	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1963	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1964	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1965	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1966	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1967	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1968	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1969	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1970	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1971	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1972	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1973	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1974	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1975	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1976	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1977	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1978	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1979	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1980	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1981	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1982	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1983	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1984	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1985	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1986	10.69	8.83	7.23	6.05	4.65	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1987	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1988	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1989	12.01	9.37	8.86	7.13	7.29	4.95	5.33	11.00	13.60	15.54	16.92	12.78	117.57
1990	10.69	8.83	7.23	6.05	4.65	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
1991	12.01	9.37	8.86	7.13	7.29	9.87	8.68	12.02	12.07	16.19	13.68	13.50	130.67
AVG	10.90	8.91	7.49	6.22	5.06	5.79	5.90	11.17	13.34	15.65	16.36	12.90	119.82

Difference in CCWD Delta Diversions (TAF)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485+NMFS+USFWS OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	0	-1.88	-0.46	12.11	-1.13	6.16	-5.33	0	-4.03	0	0	11.90	17.34
1923	10.77	0.17	0	0	0	0	-5.33	0	0	0	0	10.00	15.61
1924	0.53	0	0	0	0	0	-8.68	-6.01	-1.46	-0.02	-8.24	-9.91	-33.79
1925	-10.56	-5.83	-0.09	-0.11	-0.12	0	0	0	0	0	0	11.90	-4.81
1926	12.30	0	0	0	0	0	-5.33	0	0	0	0	0	6.97
1927	0	0	12.30	0	0	0	0	0	11.90	0	0	11.90	36.10
1928	11.60	0.11	0	0	0	0	-5.33	0	7.08	0	0	2.88	16.34
1929	0.58	0	-1.41	0	0	0	-8.68	0	0	0	-7.78	-10.08	-27.37
1930	-9.46	-7.76	-5.60	0	0	0	0	0	11.90	12.30	0	11.90	13.28
1931	0	-2.80	-2.07	0	0	0	-8.68	0	0	0	-7.69	-7.51	-28.75
1932	0	0	-0.05	0	0	0	0	0	0	0	0	11.90	11.85
1933	11.26	0	0	0	0	0	-8.68	0	0	0	-4.96	0	-2.38
1934	-3.86	0	0	0	0	0	0	0	0	0	0	0	-3.86
1935	0	0	0	0	0	0	0	0	11.90	0	0	11.90	23.80
1936	12.30	11.22	0	0	-2.19	0	-5.33	0	0	0	0	11.90	27.90
1937	12.30	1.88	0	-1.06	-2.12	-3.32	-5.33	-5.50	-2.54	0	0	11.90	6.21
1938	9.65	0.19	0	0	-1.91	0	-5.33	-5.50	-6.01	0	0	11.90	3.00
1939	9.62	0.24	0.07	0	0	0	-8.68	0	0	0	-5.39	-3.12	-7.26
1940	0	0	0	-3.30	-4.20	0	-2.07	0	0	0	0	11.90	2.33
1941	12.30	10.36	0	-2.03	-2.90	-0.53	-5.33	0	0	0	0	9.62	21.49
1942	0.53	0.19	0.02	0	0	0	-5.33	0	0	0	0	9.33	4.74
1943	0.55	0.19	0	0	0	0	-5.33	0	7.00	0	0	2.88	5.29
1944	0.57	0	0	0	0	0	-5.33	-5.50	-5.73	0	0	0	-15.99
1945	0	0	12.30	0	8.88	0	-5.33	-5.50	-5.82	0	0	11.90	16.43
1946	9.57	0.13	0.03	0	0	0	-5.33	-5.50	0.37	0	0	11.90	11.17
1947	3.82	0	0	0	0	0	-5.33	-5.50	-5.62	0	0	0	-12.63
1948	0	0	0	0	0	0	-5.33	0	0	0	0	11.90	6.57
1949	12.30	7.39	0.09	0	0	0.06	-5.33	-5.50	-5.80	0	0	0	3.21
1950	0	0	-2.50	-0.57	0	0	-5.17	0	11.90	0	0	11.90	15.56
1951	10.21	0.46	0	0	0	0	-5.33	-5.50	-5.81	0	0	11.90	5.93
1952	9.63	0.17	0	-2.46	1.30	0	-5.33	-5.50	-6.03	0	0	11.90	3.68
1953	9.68	0.22	0	0	0	0	-5.33	-5.50	-5.55	0	0	11.90	5.42
1954	9.64	0.26	0.05	0	0	0	-5.33	0	7.16	0	0	2.87	14.65
1955	0.58	0.22	0	0	0	0	-5.33	-5.50	-5.67	0	0	0	-15.70
1956	0	0	0	-4.37	-1.18	0	-4.96	0	0	0	0	11.90	1.39
1957	12.30	9.93	0.18	0	0	0	-5.33	0	0	0	0	9.61	26.69
1958	0.36	0.18	0.12	0	-3.05	-2.56	-5.33	0	0	0	0	7.97	-2.31
1959	0.65	0.39	0.15	0	0	0	-5.33	0	0	0	0	0	-4.14
1960	0	0	0	-0.44	0	0	-5.33	-0.37	11.90	0	0	10.23	15.99
1961	0.62	-2.31	0	0	0	0	-5.33	-5.50	-3.63	0	0	0	-16.15
1962	0	-3.42	0	0	-2.45	0	-3.89	0	11.90	0	0	11.90	14.04
1963	9.81	0.06	0.06	0	0	0	-5.33	-5.50	-0.85	0	0	11.90	10.15
1964	3.06	0.09	0	0	0	0	-5.33	-5.50	-4.99	0	0	0	-12.67
1965	0	0	12.30	7.41	0	0	-5.33	-5.50	-0.17	0	0	11.90	20.61
1966	3.49	0.20	0	0	0	0	-5.33	-5.50	0.51	0	0	11.30	4.67
1967	4.25	0	0	-2.42	0	0	-5.33	-5.50	-6.80	0	0	11.90	-3.90
1968	8.75	0.26	0.05	0	0	0	-5.33	0	7.27	0	0	2.87	13.87
1969	0.57	0	0.04	-1.31	0	0	-5.33	-5.50	-5.94	0	0	11.90	-5.57
1970	9.49	0.22	0.04	-2.82	1.29	0	-5.33	0	0	0	0	10.17	13.06
1971	0.57	0	0	0	0	0	-5.33	0	0	0	0	9.86	5.10
1972	0.59	0.31	0.10	0	0	0	-5.33	0	-0.85	0	0	10.62	5.44
1973	0.82	0.05	0	-0.41	-2.52	0.87	-5.33	-5.50	0.25	0	0	11.90	0.13
1974	3.68	0.10	0	0	0.04	0.04	-5.33	0	-6.80	0	0	11.90	3.63
1975	5.35	0.29	0.05	0	0.05	0	-5.33	0	0	0	0	9.61	10.02
1976	0.42	0.21	0.17	0	0	0	-8.68	0	-6.04	0	-7.01	-0.97	-21.90
1977	0	-6.18	-7.02	-5.45	-4.01	-4.30	0	0	0	0	0	0	-26.96
1978	0	0	0	0	0	0	0	0	0	0	0	11.90	11.90
1979	12.30	0	0	0	0	6.16	-5.33	0	11.90	0	0	0	25.03
1980	0	11.90	12.30	0	0	0	-5.33	0	-4.51	0	0	11.90	26.26
1981	2.52	0.33	0.12	0	0	0	-5.33	0	0	0	0	0	-2.36
1982	0	0	10.58	0	0	-2.18	-5.33	0	0	0	0	10.62	13.69
1983	0.40	0	0	0	0	0	-5.33	0	0	0	7.99	0.89	3.95
1984	0.55	-0.83	0.43	0	0	0	-5.33	0	0	0	0	10.98	5.80
1985	0.67	0.18	0	0	0	0	-5.33	0	0	0	0	0	-4.48
1986	0	-2.83	0	0	-3.69	6.15	-5.33	0	0	0	0	11.90	6.20
1987	7.01	0.50	0	0	0	0	-8.68	0	0	0	-4.70	0	-5.87
1988	0	-2.05	0	0	0	0	-8.68	0	0	0	-6.30	0	-17.03
1989	0	-6.97	-7.40	-0.90	0	0	0	0	0	0	0	11.90	-3.37
1990	11.95	0	0	0	0	0	-8.68	0	0	0	-6.80	0	-3.53
1991	-0.94	0	0	0	0	0	0	0	0	0	0	0	-0.94
AVG	3.51	0.22	0.50	-0.12	-0.28	0.09	-4.92	-1.58	0.18	0.18	-0.73	6.51	3.55

Net Delta Outflow (TAF)
Existing Level of Demand, No-Action; D-1485

100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	277	299	485	698	2111	1734	800	2791	1977	489	429	324	12412
1923	317	674	1712	1716	666	362	968	663	565	433	434	342	8853
1924	277	287	351	392	352	277	268	277	229	237	194	160	3300
1925	215	235	298	281	2560	738	841	797	637	532	422	240	7796
1926	277	268	277	520	1693	390	803	466	364	393	400	241	6093
1927	277	754	470	1467	6839	2376	2562	1218	833	615	484	309	18204
1928	277	732	438	968	1000	5879	1134	466	451	533	490	296	12663
1929	277	268	360	356	405	316	280	279	231	362	226	183	3543
1930	215	208	365	914	443	1301	451	466	407	436	423	241	5870
1931	277	268	277	359	280	277	268	277	229	237	194	166	3109
1932	215	208	511	557	790	362	451	466	407	411	259	220	4857
1933	277	281	277	365	273	291	268	277	229	237	194	175	3144
1934	215	208	336	589	455	281	268	277	229	237	194	180	3469
1935	215	247	215	1452	666	1208	2235	909	637	525	488	355	9153
1936	277	280	366	1536	4335	1521	703	797	637	523	487	332	11793
1937	277	343	277	390	2083	2883	761	725	565	400	401	231	9336
1938	277	1205	3578	1704	7906	10222	3858	4002	2503	615	468	388	36726
1939	979	468	358	406	433	398	399	299	231	393	400	215	4979
1940	277	363	277	1338	2596	6261	3447	797	637	528	518	336	17375
1941	277	332	2303	6008	6599	5845	4632	2386	940	615	469	312	30718
1942	641	618	3567	4881	7773	1345	2812	2074	1351	615	450	245	26372
1943	880	698	1360	4820	3094	4934	1403	826	833	615	465	312	20239
1944	277	268	367	382	1204	754	516	466	364	390	356	229	5572
1945	277	368	535	375	2360	1119	451	663	565	427	433	284	7857
1946	277	513	3924	2798	796	958	451	797	637	534	476	273	12433
1947	277	271	407	375	632	650	451	466	364	393	373	246	4905
1948	277	268	277	396	349	738	730	1252	785	531	491	338	6431
1949	277	282	361	396	307	2642	462	466	364	390	350	265	6563
1950	277	268	277	808	1497	747	577	663	565	437	437	314	6867
1951	326	2114	5882	4008	3606	1706	597	865	451	532	521	341	20949
1952	277	368	2599	5519	4286	3805	3672	4046	2512	615	427	523	28649
1953	1151	497	2429	5946	1258	1014	714	1327	1236	615	517	322	17025
1954	369	715	331	1328	3027	2655	2084	797	637	533	490	343	13308
1955	277	356	995	929	317	362	502	466	364	390	372	268	5598
1956	277	290	4442	9991	5080	1950	811	2473	1212	615	481	338	27960
1957	943	398	277	457	1758	2435	459	785	565	436	437	342	9290
1958	598	562	1048	1968	8642	7755	6225	2576	2348	615	486	501	33325
1959	984	407	291	1844	2800	695	457	466	364	393	407	306	9414
1960	277	367	284	344	1164	738	533	466	408	439	409	264	5692
1961	277	300	377	360	1061	576	451	466	364	393	358	252	5236
1962	277	268	377	301	2660	948	483	663	565	444	404	275	7665
1963	1453	628	1137	550	4107	1652	5052	1543	833	615	519	324	18411
1964	355	1155	331	1012	328	369	499	466	364	394	403	244	5921
1965	277	337	3824	7100	1564	869	2597	853	833	615	475	310	19653
1966	418	1146	564	1437	1122	1264	451	466	408	439	439	335	8488
1967	277	364	2257	2984	3045	3420	2848	3031	2805	849	404	567	22852
1968	1194	515	430	1343	3633	1993	451	466	408	439	439	289	11601
1969	277	351	768	7048	7501	3391	2791	3894	1867	615	475	518	29495
1970	1051	665	3117	11972	4949	2215	595	466	451	532	521	315	26848
1971	277	819	3766	2769	1066	2771	731	1638	980	615	516	322	16270
1972	395	372	688	592	888	1568	458	466	408	438	439	336	7048
1973	299	682	1118	4585	5114	3518	595	809	833	615	479	317	18964
1974	290	3301	4109	7831	2337	6497	3944	1277	933	615	489	445	32069
1975	682	589	588	453	3722	5345	932	1808	1252	522	482	346	16721
1976	782	612	415	349	490	373	318	277	231	370	348	195	4760
1977	215	344	293	289	250	277	268	277	229	237	194	149	3022
1978	215	208	375	3905	3241	3894	2268	1259	833	615	490	313	17616
1979	303	305	277	1008	2263	1734	584	617	364	390	400	332	8577
1980	281	615	736	6461	7465	4273	983	877	833	615	493	255	23888
1981	620	368	403	787	987	1721	451	466	364	393	406	277	7243
1982	277	1403	5212	4972	5488	5124	8433	3249	1357	615	451	805	37387
1983	1886	2560	5353	6347	10411	16055	6492	5168	4566	1924	569	1365	62696
1984	2030	4515	9512	5198	2686	2386	674	627	451	520	506	326	29430
1985	567	1638	1255	422	678	773	451	466	364	393	406	293	7706
1986	277	311	463	732	12180	9441	1842	803	451	466	473	299	27739
1987	338	268	285	394	540	1161	399	299	231	391	354	232	4891
1988	277	268	405	1100	337	277	298	277	231	392	287	210	4359
1989	215	241	249	331	270	2022	703	466	407	447	444	367	6161
1990	284	268	337	483	336	304	357	292	231	369	194	190	3645
1991	215	216	241	277	257	1149	327	277	230	354	203	236	3982
AVG	450	617	1321	2185	2620	2390	1386	1065	765	499	414	319	14031

Difference in Net Delta Outflow (TAF)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485 100BW-100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	0	-2	1	-10	2	-7	5	2	-4	9	0	0	-4
1923	-6	0	0	-4	0	0	-10	0	0	1	0	0	-19
1924	0	0	-1	0	0	0	0	0	0	0	0	-6	-7
1925	0	0	0	0	1	0	-2	0	0	8	-2	7	12
1926	0	0	0	0	-8	0	2	0	0	0	0	0	-6
1927	0	0	-1	-21	0	0	6	0	0	0	0	1	-15
1928	0	-12	0	0	0	0	6	0	0	0	0	0	-6
1929	0	0	-1	0	0	0	0	0	0	-3	-4	0	-8
1930	0	0	0	0	-11	-2	0	0	0	5	-12	3	-17
1931	0	0	0	0	0	0	0	0	0	0	0	0	0
1932	0	0	0	-5	39	0	0	0	0	-3	0	0	31
1933	0	-3	0	1	0	0	0	0	0	0	0	0	-2
1934	0	0	2	0	22	0	0	0	0	0	0	0	24
1935	0	0	0	0	0	0	0	0	0	7	4	1	12
1936	5	-1	-1	-4	-47	-10	5	0	0	0	0	-2	-55
1937	0	-1	0	0	0	3	5	0	0	0	1	0	8
1938	0	-11	-2	1	1	0	5	0	-7	0	1	-3	-15
1939	-1	0	0	0	0	1	0	0	0	-1	0	0	-1
1940	0	0	0	4	25	2	0	0	0	7	4	0	42
1941	0	0	-45	1	3	1	6	0	-6	0	0	1	-39
1942	-1	-1	-3	0	0	0	6	0	-6	0	0	-1	-6
1943	-1	-1	0	0	-2	0	5	0	0	0	0	0	1
1944	0	0	0	0	-1	0	-3	0	0	0	0	0	-4
1945	0	3	-21	0	8	1	0	0	0	1	0	0	-8
1946	0	-5	-1	-1	0	0	0	0	0	0	0	1	-6
1947	0	-1	-2	2	0	0	0	0	0	0	-1	0	-2
1948	0	0	0	0	0	0	5	-1	-12	-2	0	0	-10
1949	0	-1	1	0	0	0	-3	0	0	0	-1	0	-4
1950	0	0	0	3	-9	0	5	0	0	0	1	-2	-2
1951	0	-2	-3	0	0	2	5	0	0	1	0	0	3
1952	0	-9	-4	2	0	0	5	0	-7	0	2	-1	-12
1953	-4	0	0	0	0	0	5	6	0	0	0	0	7
1954	-1	-8	0	-1	0	-6	5	0	0	0	0	0	-11
1955	0	-3	-1	-2	-1	0	-1	0	0	1	0	0	-7
1956	0	-8	2	4	0	-5	10	0	0	0	-1	-1	1
1957	-3	-1	0	0	0	-6	-4	7	0	1	1	0	-5
1958	-6	-3	0	1	3	4	5	0	-6	0	1	-1	-2
1959	-1	-1	0	0	-2	0	-3	0	0	4	-1	0	-4
1960	0	0	-1	0	0	0	-2	0	0	1	0	0	-2
1961	0	-1	0	0	-5	0	0	0	0	3	0	0	-3
1962	0	0	0	0	2	-6	-4	0	0	0	0	1	-7
1963	-6	0	0	-1	1	0	5	0	0	0	1	0	0
1964	0	-12	0	0	0	0	-3	0	0	0	1	0	-14
1965	0	-1	-2	0	0	0	5	0	0	0	0	0	2
1966	-7	-4	-1	0	0	0	0	0	0	0	0	1	-11
1967	0	0	-5	3	-1	0	6	0	-5	0	1	-4	-5
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	-1	-3	0	0	5	0	-7	0	0	-1	-7
1970	-1	-1	0	3	-1	-3	0	0	0	0	1	0	-2
1971	0	-6	0	0	0	0	6	0	1	0	0	0	1
1972	-1	-3	-9	0	0	0	-3	0	0	0	1	0	-15
1973	0	-3	-1	2	2	-1	5	0	0	0	1	1	6
1974	1	-11	0	0	0	0	6	0	1	0	0	-1	-4
1975	0	-9	0	0	0	0	6	0	-7	0	0	-1	-11
1976	-1	0	0	0	0	-3	-6	0	0	-4	-2	-1	-17
1977	0	0	-3	0	0	0	0	0	0	0	0	0	-3
1978	0	0	0	45	0	3	0	0	0	0	4	5	57
1979	-10	-4	0	1	-43	-6	5	0	0	1	0	0	-56
1980	-4	-4	-1	0	0	-6	6	0	0	0	0	1	-8
1981	-6	-2	0	0	-1	-1	0	0	0	0	1	0	-9
1982	0	0	-1	0	6	2	5	0	-7	0	1	-4	2
1983	-1	0	0	0	0	0	5	0	-5	-1	-1	-1	-4
1984	-1	1	-1	0	0	0	5	0	0	1	1	-1	5
1985	0	-4	0	-5	-3	0	0	0	0	0	0	0	-12
1986	0	-2	0	-4	4	-2	6	0	0	0	0	1	3
1987	-1	0	2	1	0	-6	0	0	0	-1	-1	0	-6
1988	0	0	1	-1	5	0	-3	0	-1	0	0	0	1
1989	0	0	0	0	1	-6	0	0	0	6	2	1	4
1990	-1	0	0	0	0	0	0	0	0	-2	0	9	6
1991	0	-8	-7	0	-1	0	0	0	0	2	0	0	-14
AVG	-1	-2	-2	0	-0	-1	2	0	-1	1	0	0	-4

Net Delta Outflow (TAF)
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS OCAP BO

167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	277	268	485	707	2246	1793	1161	2955	2051	473	441	369	13226
1923	412	681	1712	1621	718	594	1294	870	642	401	384	378	9707
1924	307	268	331	389	704	345	436	277	269	257	239	155	3978
1925	215	234	306	285	2702	1027	1268	1044	714	474	438	376	9083
1926	277	268	277	589	1848	726	1236	466	404	286	362	384	7122
1927	296	754	724	1789	6620	2352	2785	1430	833	615	475	371	19044
1928	355	735	439	1161	1148	5691	1432	693	491	414	438	378	13377
1929	303	268	292	405	721	585	439	308	269	237	225	226	4278
1930	215	208	421	1209	822	1616	637	466	447	330	397	230	6998
1931	277	268	277	428	510	350	438	304	269	237	194	205	3757
1932	215	208	588	641	731	499	503	505	447	330	384	308	5358
1933	277	268	277	480	597	569	436	327	269	264	366	239	4369
1934	215	208	367	677	717	593	438	282	269	237	264	230	4498
1935	215	261	242	1429	666	1334	2575	1122	714	474	440	374	9847
1936	359	268	282	1702	4473	1528	1064	800	714	474	441	375	12479
1937	345	268	277	412	2172	2968	1121	937	642	400	385	372	10300
1938	337	1264	3578	1547	7533	10084	3886	4095	2577	615	481	390	36387
1939	975	447	320	408	562	628	437	299	269	258	365	382	5348
1940	277	268	284	1396	3169	6339	3661	946	714	474	473	373	18374
1941	334	281	2538	5928	6599	5845	4850	2598	1014	615	477	350	31428
1942	695	625	3396	4881	7773	1445	2975	2280	1426	615	479	322	26911
1943	944	702	1252	4820	3077	4770	1657	1039	833	615	475	373	20557
1944	296	301	311	446	1239	1111	454	466	404	286	363	372	6048
1945	277	383	609	432	2611	1235	598	715	642	401	386	368	8658
1946	277	784	3924	2721	952	1130	648	797	714	474	439	370	13229
1947	290	268	433	331	868	1059	619	466	404	286	360	369	5751
1948	277	268	277	494	470	740	1536	1764	859	474	435	383	7977
1949	361	385	313	336	573	2652	611	499	404	286	363	336	7119
1950	277	268	277	1110	1590	1130	938	817	642	401	382	386	8218
1951	365	2723	6089	4008	3655	1825	855	1028	491	467	470	378	22353
1952	343	589	2549	5482	4286	3829	3791	4138	2586	713	478	523	29305
1953	1026	497	2429	5946	1201	1127	952	1538	1318	615	465	378	17491
1954	478	744	364	1564	3045	2643	2342	845	714	474	430	381	14023
1955	357	455	1207	1049	597	557	477	481	404	286	358	386	6614
1956	277	273	5120	9991	5151	2088	1067	2685	1286	615	466	393	29411
1957	1013	420	310	385	1802	2425	540	1214	642	401	372	385	9910
1958	847	715	1207	1915	8642	7580	6319	2788	2422	615	468	501	34019
1959	1014	471	310	1837	2759	961	506	499	404	286	355	396	9797
1960	310	268	280	385	1397	1370	451	532	448	330	379	382	6532
1961	277	280	642	402	1640	970	451	466	404	286	358	331	6506
1962	277	268	500	307	3202	1336	564	663	642	400	372	340	8871
1963	1659	628	1405	1133	4112	1698	5144	1756	833	615	461	383	19828
1964	490	1394	368	1191	640	533	469	466	404	286	361	384	6986
1965	277	326	4585	7100	1670	1143	2801	1066	833	615	474	372	21261
1966	656	1167	586	1437	1228	1265	650	624	448	330	377	385	9153
1967	335	542	2346	2874	3110	3405	2975	3124	2879	1037	476	510	23613
1968	1051	515	430	1460	3392	1963	506	630	448	330	388	377	11491
1969	311	304	1257	7153	7501	3339	2937	3987	1942	615	473	518	30337
1970	1014	665	3117	11972	4686	2123	595	699	491	467	461	380	26669
1971	347	1204	3785	2708	1197	2781	1073	1850	1054	615	464	378	17456
1972	535	426	738	607	1125	1658	559	620	448	330	371	378	7796
1973	406	1066	1427	4455	5114	3504	862	1022	833	615	461	380	20144
1974	356	3154	4109	7831	2337	6486	4074	1489	1007	615	465	445	32368
1975	839	592	588	508	3558	5170	1187	2021	1327	474	435	436	17134
1976	960	746	421	389	863	721	440	277	269	251	366	303	6006
1977	215	208	234	277	250	277	440	327	269	237	231	149	3115
1978	215	208	342	4574	2975	3883	2388	1472	833	615	471	369	18345
1979	318	305	277	1066	2091	1773	861	829	404	286	362	381	8953
1980	446	751	736	6416	7465	4187	1124	1041	833	615	474	328	24416
1981	700	383	403	951	1184	1492	620	466	404	286	361	383	7633
1982	315	1833	5021	4980	5527	5174	8677	3341	1431	696	479	740	38215
1983	1867	2560	5353	6333	10139	15957	6478	5261	4640	2112	569	1365	62634
1984	2030	4424	9507	5024	2632	2360	909	839	491	467	474	503	29661
1985	636	1747	1255	425	865	926	527	466	404	286	363	382	8281
1986	295	268	478	1036	12453	9484	2130	1052	525	467	479	344	29012
1987	338	276	277	370	855	1409	436	299	269	257	364	308	5458
1988	277	268	446	1313	505	277	446	292	269	257	364	296	5010
1989	215	208	231	315	308	2666	1118	466	447	330	386	342	7032
1990	277	268	277	606	665	546	440	333	269	256	364	282	4583
1991	215	208	215	277	298	1444	625	315	269	323	361	283	4834
AVG	491	657	1372	2240	2722	2501	1571	1184	815	455	406	380	14795

Difference in Net Delta Outflow (TAF)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485+NMFS+USFWS OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	0	0	1	-11	1	-7	0	1	0	0	0	4	-11
1923	-25	0	0	0	0	-2	0	0	0	0	0	3	-24
1924	0	0	0	0	0	0	0	0	0	0	-14	0	-14
1925	0	-2	0	0	1	0	46	0	0	0	0	0	45
1926	0	0	0	0	-7	0	0	0	0	0	0	0	-7
1927	0	0	-13	-1	1	0	0	0	0	0	0	4	-9
1928	-4	-4	0	0	0	-1	0	0	0	0	0	1	-8
1929	0	0	0	0	0	0	0	0	0	0	-16	1	-15
1930	0	0	23	0	0	0	18	0	0	0	0	-3	38
1931	0	0	0	0	0	0	0	0	0	0	0	0	0
1932	0	0	0	0	3	0	0	0	0	0	0	5	8
1933	0	0	0	0	-12	0	0	0	0	21	-5	-15	-11
1934	0	0	13	0	0	0	0	0	0	0	-2	0	11
1935	0	0	0	0	0	0	0	0	0	0	0	4	4
1936	-1	0	0	-22	-11	0	0	0	0	0	0	4	-30
1937	-1	0	0	0	-11	5	0	0	0	1	0	4	-2
1938	0	-32	0	0	13	-2	7	3	0	0	0	-11	-22
1939	-8	-1	-2	0	0	0	0	0	0	0	0	-1	-12
1940	0	0	0	0	2	4	2	0	0	0	0	3	11
1941	0	4	-39	0	3	1	3	0	0	0	0	2	-26
1942	-1	0	-12	0	0	0	0	0	0	0	0	3	-10
1943	-1	0	-11	0	0	0	0	0	0	0	0	1	-11
1944	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	-12	0	-9	0	0	0	0	0	0	0	-21
1946	0	-10	0	-9	0	0	0	0	0	0	0	0	-19
1947	4	0	-7	0	0	0	0	0	0	0	0	0	-3
1948	0	0	0	0	0	0	-10	0	0	0	0	4	-6
1949	0	-19	0	0	0	-1	0	0	0	0	0	0	-20
1950	0	0	0	1	0	0	0	0	0	1	0	3	5
1951	0	-35	0	0	17	-42	0	0	0	0	0	4	-56
1952	-3	-3	-1	-9	-1	0	7	4	0	0	0	-12	-18
1953	-10	0	0	0	0	0	0	0	0	0	0	4	-6
1954	-10	0	0	-13	0	0	0	0	0	0	0	0	-23
1955	0	-1	-1	0	0	0	0	0	0	0	0	0	-2
1956	0	0	0	5	2	0	0	0	0	0	0	-12	-5
1957	-12	0	0	0	0	0	0	0	0	0	0	3	-9
1958	0	-1	0	-13	3	3	4	0	0	0	0	-8	-12
1959	-1	0	0	0	0	0	0	0	0	0	0	0	-1
1960	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	-1	-4	0	0	0	0	0	0	0	0	0	-5
1962	0	0	2	0	2	0	0	0	0	0	0	0	4
1963	-19	0	0	-2	0	0	3	0	0	0	0	5	-13
1964	-3	0	0	0	0	0	0	0	0	0	0	0	-3
1965	0	-1	-32	-7	0	0	0	0	0	0	0	3	-37
1966	-17	0	-1	0	0	0	0	0	0	0	0	4	-14
1967	1	-13	-4	-2	-1	0	0	3	0	0	0	-12	-28
1968	-8	0	0	0	0	0	0	0	0	0	0	0	-8
1969	0	1	0	-2	0	0	0	4	0	0	0	-12	-9
1970	-9	-1	0	3	-2	13	0	0	0	0	0	3	7
1971	-2	-5	0	0	-1	0	0	0	0	0	0	3	-5
1972	0	0	-13	0	0	0	0	0	0	0	0	3	-10
1973	-10	-2	-1	-1	2	-1	0	0	0	0	0	4	-9
1974	0	-18	0	0	0	0	3	0	0	0	0	-12	-27
1975	-6	0	0	0	0	0	0	0	0	0	0	-10	-16
1976	0	0	0	0	0	0	0	0	0	0	0	-10	-10
1977	0	0	-6	0	0	0	0	0	0	0	0	0	-6
1978	0	0	0	36	8	8	0	0	0	0	0	0	52
1979	0	0	0	4	-21	-6	12	0	0	0	0	0	-11
1980	2	-12	-12	0	0	0	0	0	0	0	0	0	-22
1981	2	0	0	0	1	-14	0	0	0	0	0	0	-11
1982	1	-1	-11	7	0	2	7	0	0	0	0	-11	-6
1983	0	0	0	0	0	-1	6	0	0	0	-8	-1	-4
1984	-1	1	0	0	0	0	0	0	0	0	0	-11	-11
1985	-1	0	0	0	0	0	0	0	0	0	0	0	-1
1986	0	0	0	1	6	-6	0	0	0	0	0	3	4
1987	-7	-1	0	0	0	3	0	0	0	0	0	0	-5
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	9	0	0	0	0	0	0	9
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
AVG	-2	-2	-2	-1	-0	-1	2	0	0	0	-1	-1	-7

QWEST (CFS) 100BH
Existing Level of Demand, No-Action; D-1485

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	-496	-1568	-924	664	7708	3040	1241	6220	5125	-1720	-2331	-2223
1923	-2067	37	3500	3216	2864	-1513	1972	2698	2310	-2694	-3727	-2806
1924	-1041	-1725	-2578	-2594	-2708	-575	-722	359	-11	397	764	265
1925	-212	-931	-1336	-716	1510	-1103	577	3281	1658	-2311	-2375	-813
1926	-893	-295	-493	-2113	-1364	-2898	-650	1081	96	-2986	-4046	-832
1927	-700	-849	-3151	-3373	9309	692	1917	5175	3199	-1739	-2949	-1878
1928	-1050	-258	-2018	-4137	2254	9259	-2900	1542	559	-2312	-3613	-1683
1929	-891	-1261	-2467	-1661	-1917	-1415	130	503	-351	-2235	-348	-73
1930	432	-625	-2477	-4757	-2028	-3557	-728	732	377	-2751	-3613	-797
1931	-500	-945	-1172	-1621	-1162	1791	962	1085	413	1568	785	151
1932	1291	929	-1180	-1479	4974	104	-342	1016	217	-2465	-268	-508
1933	669	-1203	-1384	-1667	-1218	-1162	1651	1420	576	473	649	21
1934	454	1041	-1730	-1540	-248	-1149	1002	763	516	1444	479	-24
1935	897	-671	-250	471	5091	3341	1962	3712	1120	-2210	-3474	-3413
1936	-1328	-1601	-2780	-1279	13729	-2338	-127	3279	2318	-2167	-3496	-2428
1937	-925	-2463	-682	-1360	8505	12207	582	4186	2466	-1740	-2596	-694
1938	-811	-4297	754	208	31817	36739	8994	18132	14486	2220	-1701	-1221
1939	4376	-1694	-1998	-1132	968	-278	-1056	439	-531	-2986	-3988	-650
1940	-251	-2809	-1407	-1626	2198	5438	-1443	3368	2423	-2245	-3370	-2575
1941	-110	-2025	-1379	7437	14324	15487	10310	3258	4839	-13	-1987	-1930
1942	959	-1033	3593	10555	13619	4157	3501	2411	1374	-1106	-2086	-862
1943	4593	214	-2488	10913	9359	19863	-211	3662	2686	-1681	-2390	-1917
1944	-664	-605	-2550	-1948	4603	-480	-1946	908	263	-2976	-2677	-700
1945	-879	-1622	-941	-1419	5939	3778	-476	2652	2092	-2567	-3639	-1449
1946	-561	-894	5743	1134	1771	2694	-13	2987	1356	-2272	-3267	-1147
1947	-1074	-1374	-1825	-2165	4	-1418	-857	971	171	-2971	-3402	-939
1948	-1280	-1161	-935	-2776	-2655	-625	-741	-606	1549	-2502	-3798	-2715
1949	-1339	-1631	-2678	-2704	-1592	665	-1205	767	159	-2985	-2453	-1113
1950	-878	-806	-811	-4233	-1673	-718	-1140	2468	1723	-2761	-3861	-2052
1951	-2177	3810	21703	11514	8103	819	55	3525	1155	-2312	-3498	-2915
1952	-911	-2281	1438	14741	8722	9703	8337	14105	10154	731	-1382	-740
1953	5042	-1660	-25	5955	1024	3145	588	-43	-1371	-1972	-3593	-2353
1954	-3100	-736	-2537	-4360	-319	195	-892	2734	1693	-2420	-3752	-3050
1955	-1045	-2709	505	-2653	-1661	-1748	-1603	672	135	-3050	-3423	-1184
1956	-795	-1533	3318	29549	12318	-1911	1078	4859	7304	-817	-2480	-2744
1957	4675	-2373	-745	-1587	-902	161	-966	2735	1752	-2870	-4010	-2962
1958	-2361	-1593	-4580	-717	10925	21306	26581	6364	9734	13	-2377	-2159
1959	4901	-2069	-1640	-1600	4330	635	-1115	980	-9	-3113	-4178	-1730
1960	-721	-2941	-1504	-1416	-3336	-990	-2398	354	340	-2848	-3658	-1175
1961	-582	-1527	-3232	-1524	-4912	-2117	-52	757	100	-3088	-2848	-1032
1962	-303	-723	-2938	-999	3645	-457	-1471	2279	786	-2955	-3377	-1315
1963	-21	-1793	-4971	-1417	7208	-754	5879	-82	2006	-2072	-3588	-2295
1964	-2647	-4028	-2609	-3916	-2069	-2302	-1821	1074	242	-3077	-4228	-933
1965	-725	-2241	6995	15880	-128	1041	1114	3417	2864	-1662	-2792	-1997
1966	510	-1883	306	-931	3353	-1875	-921	1277	233	-2916	-3990	-2669
1967	-678	-2692	131	4237	2648	5475	10285	10216	13144	5638	-872	-837
1968	5510	-1610	-2001	-2898	7741	1040	-770	1234	225	-2941	-3824	-1639
1969	-919	-2534	-833	15471	32382	9182	9636	25583	10925	3629	-2015	-1770
1970	4482	344	1138	25057	11927	3795	51	1244	1053	-2504	-3623	-2157
1971	-795	540	4576	-82	-3613	-157	-90	896	3009	-2031	-3601	-2329
1972	-3114	-2743	-799	-1249	893	-1465	-1102	1049	249	-2991	-4106	-2667
1973	-1576	-355	-4626	5206	13273	7617	-134	2885	2640	-2094	-2950	-2118
1974	-1443	1832	5487	11707	1285	11334	692	5684	3296	-639	-2588	-3326
1975	164	-193	-689	-1901	11936	12669	2237	2273	614	-2506	-3588	-3098
1976	295	-63	-1873	-1679	-2396	-1330	-1545	-66	-600	-2448	-2204	-205
1977	-23	-2220	-1648	-960	-970	2117	1753	1301	1421	1358	641	913
1978	1953	257	-2728	4985	9244	7817	5600	9039	6192	-180	-2374	-1944
1979	-1844	-2040	-289	-2196	7285	2854	-100	1605	657	-3087	-3929	-2482
1980	-1290	-377	-736	20408	31151	23177	6163	5911	5008	273	-2362	-980
1981	2150	-1306	-1696	-3661	-3534	990	-852	1335	47	-3082	-4053	-1261
1982	-369	-3965	3070	12724	17214	21716	37369	22129	9694	2173	-1498	1606
1983	6163	8460	26299	31597	56872	72713	39496	33107	32958	17864	910	8529
1984	10594	19236	36349	30767	15045	8211	2635	3146	1742	-2216	-3123	-2356
1985	-1409	-1324	-1533	-1288	885	2373	-437	1485	145	-3028	-4008	-1577
1986	-352	-1700	-1952	-177	38941	38041	17757	7166	2350	-728	-2047	-1582
1987	159	465	-1147	-2619	-1491	-4001	-676	416	-529	-2966	-2604	-730
1988	530	-767	-2669	-4464	-2263	-932	-1205	165	-606	-3178	-1233	-526
1989	-555	-916	-919	-1379	-1138	-2035	-1032	1285	225	-2929	-4017	-3713
1990	-1416	-439	-2006	-2457	-2273	-1358	801	395	-611	-2392	483	-205
1991	623	-572	-860	-495	-1062	-3968	-1617	-264	-457	-2184	-153	-697
AVG	176	-758	421	2564	5861	4868	2536	3753	2615	-1370	-2581	-1363

Difference in QWEST (CFS)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485 100BW-100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	19	14	-188	22	-100	89	4	-65	-98	-16	-14
1923	140	0	0	-9	0	-87	-76	0	-86	-10	-11	-9
1924	-6	0	11	0	0	-2	101	64	43	106	114	83
1925	4	0	0	0	4	-71	-8	0	-141	-106	-97	-71
1926	0	12	19	0	-145	-9	70	0	-85	-10	-13	0
1927	0	0	-20	-45	4	0	90	0	-85	-12	-10	-8
1928	-12	-58	0	0	0	-1	100	0	-84	-9	-11	-7
1929	-7	16	20	0	0	0	103	0	8	58	36	0
1930	201	92	0	3	-200	-91	18	0	-142	-115	-197	-36
1931	0	-5	16	0	0	0	-1	2	3	2	0	0
1932	0	-2	7	-77	713	0	14	21	-141	-124	0	0
1933	12	78	7	1	0	0	0	10	0	81	1	-1
1934	0	6	-39	0	400	0	0	1	1	1	0	0
1935	1	0	0	0	0	0	0	0	-142	-106	-124	-42
1936	-89	8	10	-8	-91	-79	90	0	-84	0	-14	36
1937	-7	19	17	0	24	42	90	0	-109	-11	-10	-2
1938	0	-1	-37	3	29	-15	90	0	-118	0	-19	-23
1939	-13	-6	-1	0	0	1	105	0	0	47	41	14
1940	35	26	21	41	113	4	0	0	-142	-106	-123	7
1941	-6	3	-98	23	44	5	92	0	-99	-12	-10	-8
1942	-12	-3	-7	0	0	0	89	0	-110	-12	-9	8
1943	-13	-3	0	0	-32	0	89	0	-84	-11	-10	-8
1944	0	-7	2	0	-3	0	53	0	-86	-11	-9	0
1945	11	52	-163	0	20	13	65	0	-86	-9	-11	1
1946	0	-25	-10	-2	-1	5	60	0	-87	-9	-10	-33
1947	-6	20	3	-36	0	-1	67	0	-87	-11	11	0
1948	8	34	24	6	1	0	90	-3	-200	-49	-12	-1
1949	-6	26	-18	2	12	-24	49	0	-86	-11	-3	0
1950	0	24	29	43	-150	0	89	0	-83	-9	-11	28
1951	-4	-6	-8	0	0	24	89	0	-86	-9	-10	-10
1952	-6	-42	-10	31	-12	0	90	0	-117	0	-17	-14
1953	-26	-3	0	0	-2	-1	89	89	-3	-141	-19	-16
1954	50	-42	0	-2	0	-92	90	0	-85	-8	-10	-10
1955	-7	51	-6	-5	-3	-27	28	0	-87	-10	9	0
1956	0	-57	3	62	5	-83	167	0	0	-94	-15	51
1957	-19	-5	3	-1	0	-97	44	37	-80	-10	-12	-8
1958	-36	-20	-2	0	55	58	90	0	-106	0	-12	-24
1959	-10	-7	15	-1	-32	-1	46	64	-9	-120	-26	0
1960	0	-4	18	0	-1	-45	51	0	-89	-10	0	-5
1961	0	20	8	0	-80	-1	63	63	-2	-126	-7	0
1962	0	46	23	0	43	-100	50	0	-119	0	-20	-9
1963	-33	-1	-1	-6	4	0	89	0	-70	0	-14	-11
1964	-37	-28	0	0	0	12	63	0	-93	0	-33	0
1965	0	23	-60	0	0	-5	90	0	10	-99	0	-16
1966	-38	-10	-3	0	0	-1	63	0	-89	0	-14	-11
1967	-7	10	-23	38	-1	0	90	0	-91	0	-11	-34
1968	-9	-4	-1	0	0	1	64	0	-87	-10	0	-19
1969	-6	11	-18	13	0	0	89	0	-118	0	0	-13
1970	-8	-4	-1	52	-11	-45	64	0	-88	0	-14	-13
1971	-6	-25	-1	0	-1	-1	91	0	14	-101	-12	-11
1972	-9	-17	-41	0	0	0	46	0	-90	0	-14	-12
1973	-3	-12	-2	4	42	-11	88	2	-86	0	-15	-13
1974	-4	-25	0	0	0	0	88	0	14	-102	-15	-16
1975	-10	-51	0	-1	0	0	89	0	-119	0	-17	8
1976	-8	-3	-4	0	0	-38	71	69	13	75	37	15
1977	91	61	40	0	-2	0	0	0	0	0	0	-89
1978	0	88	0	96	5	7	0	0	0	-142	-120	-117
1979	192	91	-482	20	-78	-100	89	0	-142	-15	-12	0
1980	52	-20	-31	0	0	-103	89	1	0	-88	-14	-6
1981	-35	-18	-2	0	0	-4	63	0	-89	-13	-12	-2
1982	0	0	-17	0	14	30	89	0	-130	0	-18	-27
1983	-7	0	0	0	0	0	89	0	-99	-17	-18	-15
1984	-9	30	-22	0	0	0	89	0	-94	-9	-12	15
1985	-9	-12	0	-24	-49	0	64	0	-89	-11	-12	0
1986	-1	33	0	-79	68	-34	89	0	0	-80	-17	-11
1987	-8	21	-6	-10	0	-84	75	57	40	29	82	-4
1988	31	58	15	-18	-134	-56	46	-12	24	111	111	2
1989	-12	-4	-12	-8	-26	-100	0	0	-142	-117	-129	-135
1990	-51	5	6	-7	0	-1	117	0	0	37	50	154
1991	9	223	50	4	3	1	2	1	0	-34	1	-4
AVG	3	10	-11	-1	8	-19	64	7	-68	-24	-13	-7

QWEST (CFS) 167D
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS OCAP BO

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	-508	-297	-924	706	8030	3167	2701	9571	6370	-286	-2008	-3294
1923	-2799	71	3500	3010	0	0	2262	6070	3210	-688	-2005	-3499
1924	-1895	-827	-2006	-1000	0	0	0	590	-6	-1006	-506	366
1925	308	-648	-1355	-645	1891	0	2006	6897	2555	-430	-2005	-3716
1926	-879	-257	-443	-1000	0	0	2174	1714	459	-1003	-2005	-3827
1927	-1664	-849	-1939	-1000	8628	0	5957	8630	3720	423	-2010	-3438
1928	-3158	-240	-2000	-1000	0	8853	2108	5014	1276	-715	-2005	-3614
1929	-1865	-1056	-1478	-1000	0	0	0	1090	1043	-292	-305	-532
1930	-302	-389	-2000	-1000	0	0	22	1829	1995	-14	-2004	-526
1931	355	939	636	-1000	0	0	0	845	871	12	753	-70
1932	104	513	-813	-1000	0	0	0	1885	581	-1004	-2005	-1787
1933	311	-314	-582	-1000	0	0	0	1260	673	-816	-1998	-685
1934	261	660	-2000	-1000	0	0	0	636	1978	1893	-254	-538
1935	668	-737	-694	-1000	-4	0	7981	7167	2020	-289	-2005	-3464
1936	-3429	-1228	-1409	-920	14058	0	1488	5498	3216	-242	-2005	-3495
1937	-2899	-732	-611	-1000	8719	12769	2073	7641	3354	-591	-2005	-3306
1938	-2645	-2000	754	-131	30925	34494	9464	19637	15730	1848	-2005	-1212
1939	4358	-1801	-2000	-1002	0	0	-9	919	-5	-1006	-2005	-3777
1940	-997	-328	-1228	-1000	3572	6266	2156	6453	3323	-340	-2005	-3503
1941	-2524	-1593	-872	7263	14324	15487	13673	6713	6084	558	-2007	-3040
1942	1215	-997	3224	10555	13619	0	7007	5853	2619	684	-2007	-2090
1943	4895	236	-2000	10913	9062	17196	4063	7117	3206	430	-2010	-3479
1944	-1745	-2010	-2007	-1000	0	0	-3	1997	626	-1003	-2005	-3431
1945	-683	-1549	-587	-1000	6763	0	0	5290	2991	-532	-2010	-3362
1946	-1152	439	5743	966	0	0	482	4728	2256	-394	-2005	-3516
1947	-1630	-899	-1704	-1000	0	0	0	1601	531	-1003	-2005	-3380
1948	-991	-919	-706	-1000	0	-9	1571	3496	2794	-613	-2006	-3784
1949	-3574	-2000	-2008	-1008	0	680	149	2027	523	-1003	-2005	-2707
1950	-741	-681	-634	-1000	0	0	623	5592	2625	-768	-2005	-3710
1951	-3670	5170	22147	11514	8979	1909	304	6744	1873	-461	-2005	-3675
1952	-2828	-1194	1330	14662	8722	10083	10330	15609	11399	2319	-2005	-740
1953	4445	-1660	-25	5955	0	0	457	3408	0	190	-2006	-3716
1954	-2949	-592	-2000	-1000	0	0	3452	5311	2593	-535	-2006	-3704
1955	-3491	-2000	-2000	-1000	0	0	0	1827	497	-1004	-2005	-3903
1956	-1208	-1444	4783	29549	13328	0	1119	8314	8549	435	-2005	-3047
1957	5013	-2000	-2008	-1000	0	0	0	7225	2652	-875	-2007	-3676
1958	-1177	-842	-2000	-833	10925	18461	28173	9819	10979	541	-2010	-2159
1959	5044	-1753	-2009	-1000	3593	0	0	1579	356	-1004	-2006	-3878
1960	-2039	-881	-1407	-1000	0	0	-5	3057	1055	-1007	-2007	-3872
1961	-1417	-1479	-2000	-1000	0	0	-2	1461	461	-1003	-2005	-2620
1962	-194	-631	-2000	-1004	4942	0	0	4030	1684	-1006	-2007	-2969
1963	-4730	-1793	-2000	-1000	6152	0	7430	3373	2527	90	-2006	-3866
1964	-3030	-2000	-2000	-1000	0	0	0	1512	605	-1004	-2005	-3899
1965	-460	-1983	3498	15885	1785	0	5338	6872	3385	500	-2008	-3557
1966	1646	-1834	412	-931	0	0	0	3772	951	-1008	-2006	-3778
1967	-2648	-1817	325	3998	3324	5232	12415	11720	14389	8696	-2007	-1119
1968	4830	-1610	-2001	-1000	3398	0	0	3755	942	-1008	-2004	-3748
1969	-2022	-2005	-2000	15699	32382	8335	12100	27087	12170	3157	-2007	-1770
1970	4307	344	1138	25057	7193	1801	-1	4679	1771	-649	-2006	-3684
1971	-2979	-2000	4617	-212	0	0	1019	4351	4254	131	-2006	-3682
1972	-2444	-2000	-559	-1000	0	0	0	3524	967	-1009	-2007	-3362
1973	-3196	1537	-2000	4924	13273	7389	253	6342	3161	68	-2006	-3674
1974	-3222	1504	5487	11707	1285	11149	2862	9139	4541	220	-2006	-3326
1975	909	-177	-689	-1000	8980	9826	1852	5728	1859	-571	-2005	-2993
1976	1146	598	-1845	-1000	0	0	0	577	-7	-1006	-2005	-1645
1977	377	-109	-769	-368	-4	-5	0	490	1025	1592	-95	731
1978	1963	1831	-1862	6432	4457	6745	7621	12494	6102	143	-2005	-3532
1979	-2203	-2007	-1099	-1000	6872	2938	1690	5060	1375	-1006	-2005	-3536
1980	-2243	291	-736	20312	31151	20935	4340	9135	5529	697	-2010	-2484
1981	2533	-1234	-1696	-1000	0	0	0	1969	411	-1004	-2005	-3526
1982	-1955	-2000	2657	12742	17306	22506	40237	23633	10939	3484	-2006	1285
1983	6123	8460	26299	31362	51966	71132	39271	34611	34203	20922	910	8529
1984	10594	17715	36271	27941	14074	7795	2774	6601	2460	-308	-2008	-2110
1985	-1083	-1080	-1533	-1000	0	0	262	2120	509	-1003	-2005	-3539
1986	-1655	-1193	-1879	-1000	39595	38748	17994	10796	3590	-11	-2007	-2691
1987	159	-1249	-1046	-1000	0	0	0	951	-4	-1006	-2006	-1961
1988	923	859	-2000	-1000	0	-7	0	672	-6	-1007	-2005	-1705
1989	-55	-566	-695	-1000	0	0	1157	1918	587	-1003	-2005	-2636
1990	-659	712	-493	-1000	0	0	0	1040	-7	-1007	-2005	-1416
1991	470	605	112	-340	0	0	0	1060	-3	-1000	-2007	-1426
AVG	-381	-300	694	3225	5904	4913	3863	5873	3385	193	-1827	-2550

Difference in QWEST (CFS)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485+NMFS+USFWS OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	22	7	-193	21	-100	0	2	0	0	0	-123
1923	-242	-2	0	0	0	0	0	0	0	0	0	-103
1924	-6	0	0	0	0	0	0	0	0	0	208	0
1925	235	47	6	0	5	0	103	0	0	0	0	-142
1926	-134	0	0	0	0	0	0	0	0	0	0	0
1927	0	0	-61	0	2	0	0	0	0	0	0	-122
1928	42	-25	0	0	0	-4	0	0	0	1	0	-30
1929	-7	0	0	0	0	0	0	0	0	0	109	5
1930	251	81	0	0	0	0	41	0	0	0	-4	36
1931	0	0	0	0	0	0	0	0	0	0	0	0
1932	51	0	1	0	0	0	0	0	0	0	0	-110
1933	-129	1	0	0	0	0	0	0	353	-147	22	179
1934	0	0	0	0	0	0	0	0	0	0	10	0
1935	0	0	0	0	-4	0	-1	0	0	0	0	-123
1936	-118	-133	0	-46	8	0	0	0	0	0	0	-123
1937	-118	-22	0	0	5	71	0	0	0	4	0	-123
1938	-111	0	0	0	62	-36	118	60	0	0	0	-195
1939	-153	-4	0	0	0	0	0	0	0	0	-5	37
1940	-48	0	0	0	69	54	22	0	0	0	0	-123
1941	-141	-78	-84	30	52	8	57	0	0	0	0	-102
1942	-9	-3	-27	0	0	0	0	0	0	0	0	-94
1943	-9	-3	0	0	0	0	0	0	0	0	0	-29
1944	-6	1	0	0	0	0	0	0	0	0	0	-27
1945	0	0	-202	0	-161	0	0	0	0	0	0	-141
1946	0	-51	0	-19	0	0	0	0	0	-1	0	-142
1947	-126	0	-31	0	0	0	0	0	0	0	0	0
1948	1	0	0	0	0	0	-23	0	0	0	0	-126
1949	-142	0	2	8	0	-1	0	0	0	0	0	0
1950	0	0	28	0	0	0	0	0	0	2	0	-125
1951	-90	-84	0	0	314	-681	0	0	0	0	0	-123
1952	-23	-14	-1	15	-23	0	118	61	0	0	0	-200
1953	-157	-3	0	0	0	0	0	0	0	0	0	-123
1954	-157	-4	0	0	0	0	0	0	0	0	0	-30
1955	-7	0	0	0	0	0	0	0	0	0	0	0
1956	0	0	-1	71	21	0	0	0	0	0	0	-200
1957	-200	0	-1	0	0	0	0	0	0	0	0	-101
1958	-6	-4	0	-27	55	41	57	0	0	0	0	-134
1959	-11	-6	0	0	0	0	0	0	0	0	0	0
1960	0	0	-5	0	0	0	0	0	0	0	0	-121
1961	-17	18	0	0	0	0	0	0	0	0	0	0
1962	0	41	0	0	44	0	0	0	0	0	0	-120
1963	-180	-1	0	0	-4	0	56	0	0	0	0	-120
1964	-48	0	0	0	0	0	0	0	0	0	0	0
1965	-35	-5	-242	-120	2	0	0	0	0	0	0	-123
1966	-119	-4	-4	0	0	0	0	0	0	0	0	-118
1967	-58	-62	-9	30	-3	0	0	61	0	0	0	-200
1968	-143	-4	-1	0	0	0	0	0	0	0	0	-34
1969	-6	-3	0	15	0	1	0	61	0	0	0	-200
1970	-155	-4	-1	46	-24	207	0	0	0	0	0	-106
1971	42	0	0	-1	0	0	0	0	0	0	0	-103
1972	-10	0	-63	0	0	0	0	0	0	0	0	-110
1973	-57	-13	0	4	46	-16	0	0	0	0	0	-123
1974	-42	-41	0	0	0	-1	57	0	0	0	0	-200
1975	-87	-5	0	0	-1	0	0	0	0	0	0	-162
1976	-7	-3	-3	0	0	0	0	0	0	0	0	212
1977	-1	74	50	63	0	1	0	0	0	0	1	0
1978	0	0	0	78	143	16	0	0	0	0	0	-141
1979	-142	1	186	0	-50	-100	26	0	0	0	0	0
1980	6	-200	-200	0	0	0	0	0	0	0	0	-141
1981	-21	-5	-2	0	0	0	0	0	0	0	0	1
1982	-12	0	-174	15	0	35	118	0	0	0	0	-178
1983	-7	0	0	0	0	-26	90	0	0	0	-130	-15
1984	-9	14	-7	0	0	0	0	0	0	0	0	-185
1985	-11	-3	0	0	0	0	0	0	0	0	0	0
1986	0	33	0	0	71	-99	0	0	0	0	0	-127
1987	-114	51	1	0	0	0	0	0	0	0	0	0
1988	0	25	0	0	0	0	0	0	0	0	0	1
1989	0	84	0	-4	0	0	0	0	0	0	0	-121
1990	-137	-8	-1	0	0	0	0	0	0	0	0	0
1991	0	11	0	1	0	0	0	0	0	0	0	-1
AVG	-42	-4	-12	-0	9	-9	12	4	5	-2	3	-76

Chipps Island Electrical Conductivity (μS/cm)
Existing Level of Demand, No-Action; D-1485

100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	12145	11382	7080	2735	317	323	706	315	317	1344	4987	7410
1923	9241	3684	348	327	856	4363	1267	1557	2669	4512	5706	7154
1924	9783	11052	9857	8067	7332	9365	11395	11935	13080	14136	15617	17816
1925	17906	16130	13441	12089	316	634	1111	1210	1877	3116	5003	9088
1926	11786	12045	12118	6916	339	1835	1874	3111	6112	7096	6973	9725
1927	11927	3314	3352	440	315	315	315	372	814	1972	3740	6942
1928	10188	3379	3738	1241	573	315	344	2252	4762	4228	4294	7209
1929	10444	11677	10076	8720	6776	7852	10175	11365	12827	10893	11697	15135
1930	16350	16285	12230	1952	2701	546	2073	4742	5679	5935	6045	9264
1931	11813	12052	12120	10211	9717	10992	11825	12055	13116	14147	15621	17630
1932	17684	16807	8894	4132	1411	3863	5714	5169	5737	6331	9262	12841
1933	13187	12132	11935	10014	9734	10783	11551	11978	13093	14140	15619	17382
1934	17393	16690	13127	5412	3976	7454	10865	11790	13037	14122	15612	17220
1935	17206	15512	15204	620	964	540	316	529	1669	3164	4249	6237
1936	9415	11131	9647	450	315	324	953	1368	1883	3193	4278	6634
1937	9811	9746	10365	9116	320	315	580	1558	2497	4897	6537	9831
1938	12128	868	315	321	315	315	315	315	315	850	3804	5825
1939	1317	2559	6169	7066	5600	6024	6547	8510	11735	9899	7479	10407
1940	12564	9946	10134	675	315	315	315	519	1846	3151	3908	6260
1941	9674	9960	321	315	315	315	315	315	479	1778	3876	7048
1942	4058	2494	315	315	315	325	315	316	351	1330	4033	8493
1943	2317	1505	443	315	315	315	327	786	1057	1983	3937	7106
1944	10193	11610	9897	8083	600	984	2745	4416	6299	7179	7802	10775
1945	12433	9802	5364	5913	316	400	2346	2769	2746	4594	5783	8246
1946	10864	6520	315	315	508	801	2698	1899	1906	3108	4337	7763
1947	10926	11723	9001	7605	3211	2218	3791	4937	6376	7146	7465	10089
1948	11950	12091	12131	9391	7597	2827	1583	503	898	2604	4131	6472
1949	9691	11130	9707	7837	8161	316	1131	4565	6321	7182	7918	10070
1950	11625	12000	12105	3050	351	858	2321	2352	2720	4480	5623	7610
1951	9237	324	315	315	315	320	1135	1274	2967	4052	3935	6155
1952	9580	9140	316	315	315	315	315	315	315	848	4228	4307
1953	718	2040	317	315	327	562	1247	456	409	1429	3382	6408
1954	8034	2922	4946	605	315	315	316	661	1853	3112	4181	6401
1955	9604	9410	1428	808	3728	7506	5421	4790	6354	7181	7504	9623
1956	11462	11418	315	315	315	316	647	316	368	1450	3725	6491
1957	1589	3218	8315	7372	334	315	1213	1883	2367	4447	5624	7114
1958	4378	3098	859	322	315	315	315	315	315	887	3627	4169
1959	1097	2995	7912	356	315	652	3412	4851	6363	7143	6871	8298
1960	10543	9384	9811	9891	699	1050	2662	4309	5607	5870	6224	8995
1961	11368	11135	9117	8232	868	1708	4086	4972	6381	7147	7723	10194
1962	11871	12069	9780	9559	315	458	2473	2660	2739	4393	6053	8795
1963	530	1191	649	1871	315	321	315	322	705	1967	3404	6368
1964	8282	834	3167	1246	3399	7192	5368	4803	6356	7112	6909	9614
1965	11850	10378	315	315	317	650	315	539	1030	1982	3830	7028
1966	7395	787	1750	432	414	421	2117	4747	5665	5872	5766	7232
1967	9891	9299	321	315	315	315	315	315	315	525	3477	3857
1968	630	1878	4755	543	315	316	1448	4673	5655	5882	5771	8080
1969	10749	9786	2833	315	315	315	315	315	317	1042	3748	4048
1970	906	1397	315	315	315	315	945	3830	4942	4257	3955	6564
1971	10020	2572	315	315	378	315	622	353	524	1723	3409	6417
1972	7564	7316	3260	2645	989	355	1732	4658	5653	5884	5772	7217
1973	9423	3724	674	315	315	315	703	1473	1087	1984	3788	6857
1974	9775	315	315	315	315	315	315	344	640	1796	3673	4848
1975	2802	2510	2870	4285	315	315	387	330	378	1795	4202	6436
1976	2518	2106	4407	7193	5148	5865	8252	10362	12582	10636	8873	11932
1977	15001	12061	10578	11177	11684	12017	12110	12136	13140	14155	15624	18124
1978	18276	17049	12239	315	315	315	315	370	798	1971	3684	6824
1979	9566	10203	11038	1627	316	322	1158	2581	5012	6963	6975	7888
1980	9988	4737	1930	315	315	315	390	881	1018	1981	3652	7794
1981	4815	5205	6734	2336	659	334	1632	4693	6340	7142	6878	8892
1982	11135	552	315	315	315	315	315	315	337	1325	4022	1805
1983	328	315	315	315	315	315	315	315	315	317	1164	442
1984	319	315	315	315	315	315	757	2240	3895	4282	4180	6553
1985	4824	359	394	2382	2285	1466	3260	4876	6367	7143	6877	8574
1986	10814	10733	7226	2560	315	315	316	700	3105	4858	4973	7417
1987	9145	10452	11482	9161	4355	673	2631	7796	11553	9906	8367	10866
1988	12401	12220	9224	1018	3069	8711	10512	11213	12826	10191	9762	12756
1989	14966	14851	14188	11885	10748	336	789	3366	5499	5737	5616	6626
1990	9203	11242	10482	6662	6565	8879	8876	9652	12149	10561	12253	15754
1991	16431	16085	15317	13751	12446	1114	3235	9167	12278	10952	12370	14348
AVG	9358	7755	6013	3666	2132	2039	2697	3538	4553	5234	6306	8597

Chipps Island Electrical Conductivity (µS/cm)
Existing Level of Demand, Preferred Alternative Minus No-Action; D-1485 100BW-100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	38	8	81	0	0	-6	0	0	-27	-71	-27
1923	116	47	0	0	1	0	37	14	1	-6	-8	-4
1924	0	0	12	9	2	0	0	0	0	0	0	153
1925	183	74	25	7	0	0	5	2	0	-62	-27	-120
1926	-145	-41	-12	-3	0	6	-9	-5	-1	-6	-1	2
1927	0	0	11	11	0	0	0	0	0	0	-3	-10
1928	-8	121	57	2	0	0	0	-10	-1	-8	-8	-3
1929	0	0	22	17	3	-1	-1	0	1	84	180	146
1930	54	20	7	-1	89	7	3	0	0	-84	124	93
1931	-35	-9	-3	-1	0	0	0	0	0	0	0	0
1932	0	0	-8	52	-152	-167	-22	-3	-1	51	50	14
1933	4	58	54	12	2	0	0	0	0	0	0	0
1934	0	0	-43	-20	-259	-262	-62	-17	-5	-2	0	0
1935	0	0	0	0	0	0	0	0	0	-63	-86	-52
1936	-124	-98	-9	2	0	0	-8	-8	0	-1	-8	14
1937	20	25	18	5	0	0	-6	-8	-1	0	-6	-3
1938	1	25	0	0	0	0	0	0	0	2	-10	34
1939	11	7	6	1	0	-1	0	0	0	30	9	7
1940	13	20	15	-6	0	0	0	0	0	-63	-83	-39
1941	-5	1	1	0	0	0	0	0	4	10	-4	-10
1942	10	6	0	0	0	0	0	0	1	5	-4	7
1943	12	3	0	0	0	0	-1	-2	0	0	-4	-10
1944	-7	-2	5	4	1	1	19	16	2	-4	-2	0
1945	0	-72	271	194	0	-1	-2	0	0	-6	-9	5
1946	9	91	0	0	0	-1	0	0	0	-6	-8	-39
1947	-39	19	63	3	-7	0	0	0	0	-5	4	7
1948	2	1	0	4	4	0	-24	0	26	44	12	7
1949	6	30	11	-3	5	0	9	22	3	-3	2	3
1950	1	0	0	-27	1	3	-35	-18	-1	-6	-8	31
1951	28	0	0	0	0	0	-15	-7	-1	-7	-7	-3
1952	0	188	0	0	0	0	0	0	0	2	-16	0
1953	7	8	0	0	0	0	-17	-4	-1	0	0	0
1954	34	82	52	2	0	0	0	-1	0	-5	-7	-4
1955	-1	58	11	4	10	3	21	11	2	-3	6	7
1956	1	200	0	0	0	0	-12	0	0	0	6	24
1957	17	12	6	2	1	0	13	-32	-20	-8	-8	-3
1958	81	63	4	0	0	0	0	0	0	2	-8	11
1959	4	6	18	0	0	1	33	27	4	-79	-38	5
1960	1	-3	22	20	1	0	18	15	2	-8	0	-5
1961	-8	34	37	12	13	8	1	0	0	-57	-38	-4
1962	-1	-1	12	9	0	3	36	14	1	0	-9	-19
1963	5	4	0	2	0	0	0	0	0	0	-6	-12
1964	-5	27	32	1	0	8	48	24	4	0	-7	-7
1965	-2	22	0	0	0	1	0	0	0	0	0	-13
1966	111	13	8	0	0	0	1	0	0	0	-7	-13
1967	-9	5	0	0	0	0	0	0	0	1	-10	35
1968	3	2	2	0	0	0	0	0	0	-8	-3	3
1969	3	13	13	0	0	0	0	0	0	2	-1	9
1970	2	1	0	0	0	0	1	0	0	0	-7	-4
1971	1	42	0	0	0	0	-6	0	0	-2	0	0
1972	8	57	99	31	1	0	16	25	3	1	-8	-4
1973	-3	28	3	0	0	0	-7	-9	-1	0	-6	-14
1974	-15	0	0	0	0	0	0	-1	-1	-2	6	17
1975	10	73	39	5	0	0	-1	0	2	9	1	5
1976	6	3	5	3	1	34	149	119	34	114	113	73
1977	39	9	56	50	12	4	1	1	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	-44	-127
1979	99	234	112	-1	0	1	-12	-18	-2	-7	-8	-2
1980	92	102	25	0	0	0	-2	-4	0	0	4	-6
1981	76	85	43	3	0	0	1	0	0	-6	-7	-5
1982	-4	0	0	0	0	0	0	0	1	6	-11	18
1983	0	0	0	0	0	0	0	0	0	0	3	1
1984	0	0	0	0	0	0	-9	-14	-2	-8	-8	11
1985	13	1	0	31	37	5	0	0	0	-5	-5	-2
1986	-1	49	32	36	0	0	0	-1	0	0	0	-11
1987	1	8	-43	-41	-6	8	12	2	4	26	42	19
1988	-2	0	-21	1	-39	-71	72	78	40	22	14	16
1989	8	-3	-26	-34	-46	0	1	1	0	-77	-87	-60
1990	-5	18	11	11	5	-2	-2	0	0	53	48	-238
1991	-279	125	402	265	90	3	0	0	-1	-52	-49	-25
AVE	6	28	21	11	-3	-6	3	3	1	-3	-2	-2

Percentage Difference, Chipps Island Electrical Conductivity (μS/cm)
Existing Level of Demand, Preferred Alternative Minus No-Action; D-1485 1008W-100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	0.3	0.1	3.0	0	0	-0.8	0	0	-2.0	-1.4	-0.4
1923	1.3	1.3	0	0	0.1	0	2.9	0.9	0	-0.1	-0.1	-0.1
1924	0	0	0.1	0.1	0	0	0	0	0	0	0	0.9
1925	1.0	0.5	0.2	0.1	0	0	0.5	0.2	0	-2.0	-0.5	-1.3
1926	-1.2	-0.3	-0.1	0	0	0.3	-0.5	-0.2	0	-0.1	0	0
1927	0	0	0.3	2.5	0	0	0	0	0	0	-0.1	-0.1
1928	-0.1	3.6	1.5	0.2	0	0	0	-0.4	0	-0.2	-0.2	0
1929	0	0	0.2	0.2	0	0	0	0	0	0.8	1.5	1.0
1930	0.3	0.1	0.1	-0.1	3.3	1.3	0.1	0	0	-1.4	2.1	1.0
1931	-0.3	-0.1	0	0	0	0	0	0	0	0	0	0
1932	0	0	-0.1	1.3	-10.8	-4.3	-0.4	-0.1	0	0.8	0.5	0.1
1933	0	0.5	0.5	0.1	0	0	0	0	0	0	0	0
1934	0	0	-0.3	-0.4	-6.5	-3.5	-0.6	-0.1	0	0	0	0
1935	0	0	0	0	0	0	0	0	0	-2.0	-2.0	-0.8
1936	-1.3	-0.9	-0.1	0.4	0	0	-0.8	-0.6	0	0	-0.2	0.2
1937	0.2	0.3	0.2	0.1	0	0	-1.0	-0.5	0	0	-0.1	0
1938	0	2.9	0	0	0	0	0	0	0	0.2	-0.3	0.6
1939	0.8	0.3	0.1	0	0	0	0	0	0	0.3	0.1	0.1
1940	0.1	0.2	0.1	-0.9	0	0	0	0	0	-2.0	-2.1	-0.6
1941	-0.1	0	0.3	0	0	0	0	0	0.8	0.6	-0.1	-0.1
1942	0.2	0.2	0	0	0	0	0	0	0.3	0.4	-0.1	0.1
1943	0.5	0.2	0	0	0	0	-0.3	-0.3	0	0	-0.1	-0.1
1944	-0.1	0	0.1	0	0.2	0.1	0.7	0.4	0	-0.1	0	0
1945	0	-0.7	5.1	3.3	0	-0.3	-0.1	0	0	-0.1	-0.2	0.1
1946	0.1	1.4	0	0	0	-0.1	0	0	0	-0.2	-0.2	-0.5
1947	-0.4	0.2	0.7	0	-0.2	0	0	0	0	-0.1	0.1	0.1
1948	0	0	0	0	0.1	0	-1.5	0	2.9	1.7	0.3	0.1
1949	0.1	0.3	0.1	0	0.1	0	0.8	0.5	0	0	0	0
1950	0	0	0	-0.9	0.3	0.3	-1.5	-0.8	0	-0.1	-0.1	0.4
1951	0.3	0	0	0	0	0	-1.3	-0.5	0	-0.2	-0.2	0
1952	0	2.1	0	0	0	0	0	0	0	0.2	-0.4	0
1953	1.0	0.4	0	0	0	0	-1.4	-0.9	-0.2	0	0	0
1954	0.4	2.8	1.1	0.3	0	0	0	-0.2	0	-0.2	-0.2	-0.1
1955	0	0.6	0.8	0.5	0.3	0	0.4	0.2	0	0	0.1	0.1
1956	0	1.8	0	0	0	0	-1.9	0	0	0	0.2	0.4
1957	1.1	0.4	0.1	0	0.3	0	1.1	-1.7	-0.8	-0.2	-0.1	0
1958	1.9	2.0	0.5	0	0	0	0	0	0	0.2	-0.2	0.3
1959	0.4	0.2	0.2	0	0	0.2	1.0	0.6	0.1	-1.1	-0.6	0.1
1960	0	0	0.2	0.2	0.1	0	0.7	0.3	0	-0.1	0	-0.1
1961	-0.1	0.3	0.4	0.1	1.5	0.5	0	0	0	-0.8	-0.5	0
1962	0	0	0.1	0.1	0	0.7	1.5	0.5	0	0	-0.1	-0.2
1963	0.9	0.3	0	0.1	0	0	0	0	0	0	-0.2	-0.2
1964	-0.1	3.2	1.0	0.1	0	0.1	0.9	0.5	0.1	0	-0.1	-0.1
1965	0	0.2	0	0	0	0.2	0	0	0	0	0	-0.2
1966	1.5	1.7	0.5	0	0	0	0	0	0	0	-0.1	-0.2
1967	-0.1	0.1	0	0	0	0	0	0	0	0.2	-0.3	0.9
1968	0.5	0.1	0	0	0	0	0	0	0	-0.1	-0.1	0
1969	0	0.1	0.5	0	0	0	0	0	0	0.2	0	0.2
1970	0.2	0.1	0	0	0	0	0.1	0	0	0	-0.2	-0.1
1971	0	1.6	0	0	0	0	-1.0	0	0	-0.1	0	0
1972	0.1	0.8	3.0	1.2	0.1	0	0.9	0.5	0.1	0	-0.1	-0.1
1973	0	0.8	0.4	0	0	0	-1.0	-0.6	-0.1	0	-0.2	-0.2
1974	-0.2	0	0	0	0	0	0	-0.3	-0.2	-0.1	0.2	0.4
1975	0.4	2.9	1.4	0.1	0	0	-0.3	0	0.5	0.5	0	0.1
1976	0.2	0.1	0.1	0	0	0.6	1.8	1.1	0.3	1.1	1.3	0.6
1977	0.3	0.1	0.5	0.4	0.1	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	-1.2	-1.9
1979	1.0	2.3	1.0	-0.1	0	0.3	-1.0	-0.7	0	-0.1	-0.1	0
1980	0.9	2.2	1.3	0	0	0	-0.5	-0.5	0	0	0.1	-0.1
1981	1.6	1.6	0.6	0.1	0	0	0.1	0	0	-0.1	-0.1	-0.1
1982	0	0	0	0	0	0	0	0	0.3	0.5	-0.3	1.0
1983	0	0	0	0	0	0	0	0	0	0	0.3	0.2
1984	0	0	0	0	0	0	-1.2	-0.6	-0.1	-0.2	-0.2	0.2
1985	0.3	0.3	0	1.3	1.6	0.3	0	0	0	-0.1	-0.1	0
1986	0	0.5	0.4	1.4	0	0	0	-0.1	0	0	0	-0.1
1987	0	0.1	-0.4	-0.4	-0.1	1.2	0.5	0	0	0.3	0.5	0.2
1988	0	0	-0.2	0.1	-1.3	-0.8	0.7	0.7	0.3	0.2	0.1	0.1
1989	0.1	0	-0.2	-0.3	-0.4	0	0.1	0	0	-1.3	-1.5	-0.9
1990	-0.1	0.2	0.1	0.2	0.1	0	0	0	0	0.5	0.4	-1.5
1991	-1.7	0.8	2.6	1.9	0.7	0.3	0	0	0	-0.5	-0.4	-0.2
AVE	0.2	0.6	0.4	0.2	-0.1	0	0	0	0.1	-0.1	-0.1	0

Chipps Island Electrical Conductivity (µS/cm)
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS OCAP BO 167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	12145	12147	7565	2694	316	321	408	315	316	1356	4937	6512
1923	6788	2947	347	333	784	2221	484	755	1712	4375	6740	7176
1924	8731	10789	10505	8477	2547	4538	6182	8436	11137	12330	13478	16243
1925	17376	15933	13179	11786	315	420	422	550	1220	3292	5195	6458
1926	9199	11352	11923	5724	325	785	488	2103	5383	8477	9159	7712
1927	8976	2966	1655	337	315	315	315	337	738	1968	3832	6032
1928	7687	2780	3660	761	426	315	324	1051	3145	5270	5896	6523
1929	8668	10830	11413	8828	2380	2356	4244	7501	10456	12627	14295	14835
1930	15358	15915	10725	787	740	350	1072	3655	4975	7169	7687	10165
1931	12237	12173	12154	8721	4496	5947	6330	7950	10616	12672	15122	16330
1932	16335	16279	7184	2839	1502	2884	4009	4167	4783	7137	7928	8737
1933	10628	11726	12027	7645	3103	2891	4418	7238	10136	11882	10170	10968
1934	13850	15382	11884	3893	1542	2267	4198	7950	10937	12763	13332	13710
1935	14901	14265	13781	617	975	451	315	398	1154	3286	5164	6467
1936	7663	9829	11404	399	315	323	476	1006	1500	3314	5161	6438
1937	7892	10060	11575	8915	318	315	379	713	1616	4374	6724	7258
1938	8235	659	315	326	315	315	315	315	315	834	3669	5679
1939	1324	2724	6985	7570	3829	2606	4076	7650	10621	12172	10373	7970
1940	9447	11416	11781	612	315	315	315	426	1309	3299	4737	6148
1941	8079	9976	317	315	315	315	315	315	427	1672	3786	6349
1942	3223	2257	315	315	315	322	315	316	339	1276	3732	6783
1943	1633	1390	509	315	315	315	319	496	904	1976	3832	6000
1944	8766	10189	10317	7568	531	489	2346	4753	5726	8543	9169	7950
1945	9569	8809	4163	4545	315	363	1454	1942	2042	4410	6704	7315
1946	9476	2826	315	315	419	526	1369	1459	1519	3316	5190	6555
1947	9044	11121	8388	8050	1606	630	1562	3778	5597	8518	9223	8045
1948	9626	11462	11953	7373	4498	2180	365	326	622	2799	5170	6353
1949	7497	7408	8568	9378	4309	316	808	3423	5315	8464	9145	8657
1950	10207	11614	11996	1239	331	439	678	1056	1809	4377	6756	7050
1951	7525	316	315	315	315	318	616	689	2275	4499	4963	6126
1952	7847	4405	316	315	315	315	315	315	315	686	3304	3934
1953	957	2257	317	315	330	483	660	360	372	1357	3879	6007
1954	5597	2169	4338	418	315	315	315	572	1426	3305	5308	6471
1955	7623	6224	697	568	1485	2874	4002	4610	5599	8518	9269	7747
1956	9346	11279	315	315	315	316	430	315	351	1383	3875	5783
1957	1191	2827	7423	8184	333	315	1005	595	1319	4331	6922	7186
1958	1996	1467	544	322	315	315	315	315	315	869	3803	4288
1959	1017	2450	6873	354	315	447	2291	4049	5394	8479	9325	7603
1960	8547	10700	11673	9479	440	370	1976	3962	4588	7096	8017	7363
1961	9309	11083	4731	4804	349	535	2652	4807	5733	8544	9268	8854
1962	10328	11646	7189	7583	315	341	1494	2342	2178	4432	6953	8040
1963	394	1074	431	470	315	320	315	318	656	1964	3978	5975
1964	5372	458	2429	748	1197	2894	4221	4869	5742	8546	9210	7729
1965	9359	10039	315	315	317	427	315	409	887	1975	3847	6038
1966	3461	585	1618	428	377	411	1248	2347	3949	6993	8027	7322
1967	8125	5133	318	315	315	315	315	315	315	417	2436	4012
1968	912	2100	4780	458	315	317	1278	2756	3962	6995	7819	7332
1969	8686	9885	772	315	315	315	315	315	316	1013	3762	4058
1970	994	1438	315	315	315	316	973	2017	3199	4598	5093	6191
1971	7769	742	315	315	351	315	398	326	452	1623	3914	6017
1972	4797	4942	2454	2358	554	336	1276	2645	3996	7001	8154	7556
1973	6980	966	378	315	315	315	463	693	917	1977	3977	6026
1974	7565	315	315	315	315	315	315	327	523	1685	3911	5036
1975	1790	2075	2830	3692	315	315	342	320	356	1933	5068	5529
1976	1298	1209	3654	6363	1448	1389	3545	7917	11010	12453	10518	9625
1977	12362	14886	15228	13840	12653	12295	8187	7846	10268	12575	14131	16811
1978	17737	16828	13027	315	315	315	315	337	725	1968	3877	6103
1979	8396	9716	10914	1368	317	322	618	1084	3470	8124	9099	7766
1980	6312	2254	1581	315	315	315	359	584	904	1976	3845	6732
1981	3310	4417	6474	1443	434	355	1187	3740	5592	8517	9201	7752
1982	8618	347	315	315	315	315	315	315	331	1045	3384	2083
1983	330	315	315	315	315	315	315	315	315	316	1086	442
1984	319	315	315	315	315	315	502	1017	2705	4551	4919	4349
1985	2926	339	389	2365	1262	830	2251	4302	5666	8531	9163	7737
1986	9019	11031	7482	1067	315	315	315	447	2022	4281	4824	6585
1987	8421	10112	11467	9797	1652	396	2010	7315	10543	12159	10378	9491
1988	10804	11773	8253	593	1620	6667	7025	8226	10865	12255	10414	9775
1989	12516	14936	15335	12930	10271	316	387	2282	4817	7143	7897	8025
1990	9973	11552	11979	5475	2032	2767	4477	7094	10013	12058	10379	10070
1991	12830	15039	15799	14390	11506	538	1206	5458	9903	10452	9132	9801
AVE	7675	7127	5878	3360	1334	1106	1559	2561	3724	5608	6895	7483

Chipps Island Electrical Conductivity (µS/cm)
Existing Level of Demand, Preferred Alternative Minus No-Action; D-1485+NMFS+USFWS OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	0	-10	86	0	0	0	0	0	0	0	-61
1923	376	136	0	0	0	9	1	0	0	0	0	-57
1924	-48	-12	-3	0	0	0	0	0	0	0	372	419
1925	165	130	75	16	0	0	-19	-9	0	0	0	0
1926	0	0	0	0	0	1	0	0	0	0	0	0
1927	0	0	62	0	0	0	0	0	0	0	0	-64
1928	15	58	24	0	0	0	0	0	0	-3	-2	-17
1929	-14	-4	-1	0	0	0	0	0	0	0	414	435
1930	146	54	-542	-25	0	0	-47	-82	-10	-2	-2	58
1931	64	18	5	1	0	0	0	0	0	0	0	0
1932	0	0	0	0	-18	-14	-1	0	0	0	0	-105
1933	-101	-27	-7	-2	121	52	6	1	0	-499	-311	345
1934	391	135	-272	-100	-3	0	0	0	0	0	46	46
1935	15	5	2	0	0	0	0	0	0	0	0	-61
1936	-42	-13	-11	8	0	0	0	0	0	0	0	-61
1937	-40	0	0	0	0	0	0	0	0	-11	-11	-70
1938	-56	48	0	0	0	0	0	0	0	0	0	163
1939	58	26	27	18	2	0	0	0	0	0	-7	-3
1940	0	0	0	0	0	0	0	0	0	0	0	-59
1941	-53	-109	1	0	0	0	0	0	0	0	0	-39
1942	-10	2	0	0	0	0	0	0	0	0	0	-55
1943	-7	2	9	0	0	0	0	0	0	0	0	-14
1944	-15	-4	-1	-1	0	0	0	0	0	0	0	-16
1945	-14	-3	150	85	0	1	0	0	0	0	0	0
1946	0	90	0	0	1	0	0	0	0	0	0	0
1947	-90	-90	113	91	4	0	0	0	0	0	0	0
1948	0	0	0	0	0	0	2	0	0	0	0	-52
1949	-42	337	287	55	3	0	0	0	0	0	0	0
1950	0	0	0	-2	0	0	0	0	0	-5	-5	-61
1951	-39	0	0	0	0	1	7	0	0	0	0	-57
1952	-4	46	0	0	0	0	0	0	0	0	0	135
1953	38	22	0	0	0	0	0	0	0	0	0	-56
1954	103	35	5	6	0	0	0	0	0	0	0	-15
1955	-12	27	4	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0	0	0	181
1957	64	34	5	0	0	0	0	0	0	0	0	-52
1958	-8	1	0	1	0	0	0	0	0	0	0	96
1959	13	5	5	0	0	0	0	0	0	0	0	0
1960	0	0	-7	-6	0	0	0	0	0	0	0	0
1961	0	23	61	27	0	0	0	0	0	0	0	0
1962	0	0	-33	-23	0	0	0	0	0	0	0	10
1963	7	10	0	2	0	0	0	0	0	0	0	-67
1964	-5	0	0	0	0	0	0	0	0	0	0	0
1965	0	7	0	0	0	0	0	0	0	0	0	-58
1966	144	7	4	0	0	0	0	0	0	0	0	-59
1967	-52	176	0	0	0	0	0	0	0	0	0	136
1968	34	18	3	0	0	0	0	0	0	0	0	0
1969	0	-4	1	0	0	0	0	0	0	0	0	138
1970	40	13	0	0	0	0	-4	-1	0	0	0	-49
1971	-15	9	0	0	0	0	0	0	0	0	0	-48
1972	-20	2	95	38	1	0	0	0	0	0	0	-62
1973	130	20	1	0	0	0	0	0	0	0	0	-57
1974	-49	0	0	0	0	0	0	0	0	0	0	164
1975	64	15	2	0	0	0	0	0	0	0	0	143
1976	21	2	3	2	0	0	0	0	0	0	0	221
1977	227	74	197	183	56	17	4	1	0	0	3	3
1978	1	1	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	-15	0	0	-12	-10	0	0	0	0
1980	-23	76	77	0	0	0	0	0	0	0	0	0
1981	-16	-6	4	1	-1	2	9	0	0	0	0	-1
1982	-10	0	0	0	0	0	0	0	0	0	0	67
1983	0	0	0	0	0	0	0	0	0	0	20	2
1984	0	0	0	0	0	0	0	0	0	0	0	135
1985	58	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	-2	0	0	0	0	0	0	0	-49
1987	90	129	43	11	0	-1	-4	-1	0	0	1	1
1988	0	0	0	0	0	0	0	0	0	0	2	1
1989	0	0	0	7	5	0	0	0	0	0	0	9
1990	9	2	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
AVE	21	22	5	7	2	1	-1	-1	0	-7	7	21

Percentage Difference, Chipps Island Electrical Conductivity (µS/cm)
Existing Level of Demand, Preferred Alternative Minus No-Action; D-1485+NMFS+USFWS OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	0	-0.1	3.2	0	0	0	0	0	0	0	-0.9
1923	5.5	4.6	0	0	0	0.4	0.2	0	0	0	0	-0.8
1924	-0.5	-0.1	0	0	0	0	0	0	0	0	2.8	2.6
1925	0.9	0.8	0.6	0.1	0	0	-4.5	-1.6	0	0	0	0
1926	0	0	0	0	0	0.1	0	0	0	0	0	0
1927	0	0	3.7	0	0	0	0	0	0	0	0	-1.1
1928	0.2	2.1	0.7	0	0	0	0	0	0	-0.1	0	-0.3
1929	-0.2	0	0	0	0	0	0	0	0	0	2.9	2.9
1930	1.0	0.3	-5.1	-3.2	0	0	-4.4	-2.2	-0.2	0	0	0.6
1931	0.5	0.1	0	0	0	0	0	0	0	0	0	0
1932	0	0	0	0	-1.2	-0.5	0	0	0	0	0	-1.2
1933	-1.0	-0.2	-0.1	0	3.9	1.8	0.1	0	0	-4.2	-3.1	3.1
1934	2.8	0.9	-2.3	-2.6	-0.2	0	0	0	0	0	0.3	0.3
1935	0.1	0	0	0	0	0	0	0	0	0	0	-0.9
1936	-0.5	-0.1	-0.1	2.0	0	0	0	0	0	0	0	-0.9
1937	-0.5	0	0	0	0	0	0	0	0	-0.3	-0.2	-1.0
1938	-0.7	7.3	0	0	0	0	0	0	0	0	0	2.9
1939	4.4	1.0	0.4	0.2	0.1	0	0	0	0	0	-0.1	0
1940	0	0	0	0	0	0	0	0	0	0	0	-1.0
1941	-0.7	-1.1	0.3	0	0	0	0	0	0	0	0	-0.6
1942	-0.3	0.1	0	0	0	0	0	0	0	0	0	-0.8
1943	-0.4	0.1	1.8	0	0	0	0	0	0	0	0	-0.2
1944	-0.2	0	0	0	0	0	0	0	0	0	0	-0.2
1945	-0.1	0	3.6	1.9	0	0.3	0	0	0	0	0	0
1946	0	3.2	0	0	0.2	0	0	0	0	0	0	0
1947	-1.0	-0.8	1.3	1.1	0.2	0	0	0	0	0	0	0
1948	0	0	0	0	0	0	0.5	0	0	0	0	-0.8
1949	-0.6	4.5	3.3	0.6	0.1	0	0	0	0	0	0	0
1950	0	0	0	-0.2	0	0	0	0	0	-0.1	-0.1	-0.9
1951	-0.5	0	0	0	0	0.3	1.1	0	0	0	0	-0.9
1952	-0.1	1.0	0	0	0	0	0	0	0	0	0	3.4
1953	4.0	1.0	0	0	0	0	0	0	0	0	0	-0.9
1954	1.8	1.6	0.1	1.4	0	0	0	0	0	0	0	-0.2
1955	-0.2	0.4	0.6	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0	0	0	0	3.1
1957	5.4	1.2	0.1	0	0	0	0	0	0	0	0	-0.7
1958	-0.4	0.1	0	0.3	0	0	0	0	0	0	0	2.2
1959	1.3	0.2	0.1	0	0	0	0	0	0	0	0	0
1960	0	0	-0.1	-0.1	0	0	0	0	0	0	0	0
1961	0	0.2	1.3	0.6	0	0	0	0	0	0	0	0
1962	0	0	-0.5	-0.3	0	0	0	0	0	0	0	0.1
1963	1.8	0.9	0	0.4	0	0	0	0	0	0	0	-1.1
1964	-0.1	0	0	0	0	0	0	0	0	0	0	0
1965	0	0.1	0	0	0	0	0	0	0	0	0	-1.0
1966	4.2	1.2	0.2	0	0	0	0	0	0	0	0	-0.8
1967	-0.6	3.4	0	0	0	0	0	0	0	0	0	3.4
1968	3.7	0.9	0.1	0	0	0	0	0	0	0	0	0
1969	0	0	0.1	0	0	0	0	0	0	0	0	3.4
1970	4.0	0.9	0	0	0	0	-0.4	0	0	0	0	-0.8
1971	-0.2	1.2	0	0	0	0	0	0	0	0	0	-0.8
1972	-0.4	0	3.9	1.6	0.2	0	0	0	0	0	0	-0.8
1973	1.9	2.1	0.3	0	0	0	0	0	0	0	0	-0.9
1974	-0.6	0	0	0	0	0	0	0	0	0	0	3.3
1975	3.6	0.7	0.1	0	0	0	0	0	0	0	0	2.6
1976	1.6	0.2	0.1	0	0	0	0	0	0	0	0	2.3
1977	1.8	0.5	1.3	1.3	0.4	0.1	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	-1.1	0	0	-1.9	-0.9	0	0	0	0
1980	-0.4	3.4	4.9	0	0	0	0	0	0	0	0	0
1981	-0.5	-0.1	0.1	0.1	-0.2	0.6	0.8	0	0	0	0	0
1982	-0.1	0	0	0	0	0	0	0	0	0	0	3.2
1983	0	0	0	0	0	0	0	0	0	0	1.8	0.5
1984	0	0	0	0	0	0	0	0	0	0	0	3.1
1985	2.0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	-0.2	0	0	0	0	0	0	0	-0.7
1987	1.1	1.3	0.4	0.1	0	-0.3	-0.2	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0.1	0	0	0	0	0	0	0	0.1
1990	0.1	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
AVE	0.6	0.6	0.3	0.1	0.1	0	-0.1	-0.1	0	-0.1	0.1	0.3

Total Delta Exports (Banks+North Bay Aqueduct+Tracy+Contra Costa Canal) (TAF)
Existing Level of Demand, No-Action; D-1485

100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	408	556	703	718	653	713	678	384	376	529	620	578	6916
1923	591	664	703	718	621	624	628	379	316	586	715	614	7158
1924	487	549	684	716	644	432	412	286	265	223	196	243	5139
1925	310	448	556	502	655	707	678	383	316	586	579	386	6106
1926	435	432	461	715	653	693	677	322	315	585	707	375	6370
1927	421	663	698	709	643	547	560	384	316	586	671	530	6727
1928	461	664	703	718	653	713	615	379	316	586	715	490	7013
1929	442	533	684	641	653	562	369	322	313	504	318	284	5626
1930	290	384	633	712	655	710	537	379	315	585	670	380	6250
1931	409	464	475	624	542	263	293	250	234	124	199	265	4142
1932	216	312	700	712	534	424	511	343	316	546	318	348	5280
1933	307	479	502	666	521	544	271	248	238	218	218	292	4504
1934	284	259	583	715	598	500	293	269	228	133	212	284	4360
1935	238	459	397	522	200	713	678	384	316	586	715	674	5882
1936	456	517	684	718	653	713	678	363	316	586	715	579	6979
1937	409	617	510	718	653	713	677	383	314	497	611	408	6512
1938	467	663	702	718	653	532	469	384	376	366	590	687	6606
1939	693	664	703	689	532	527	537	324	315	587	712	355	6638
1940	379	632	492	719	647	713	678	378	316	586	715	593	6850
1941	430	581	703	718	653	661	661	384	376	448	617	578	6809
1942	693	664	703	718	653	553	571	384	376	554	612	552	7033
1943	693	664	703	718	637	550	571	384	316	581	612	530	6959
1944	592	445	684	718	653	713	658	379	316	586	579	383	6707
1945	421	664	703	718	653	617	557	379	316	586	715	491	6819
1946	581	663	702	718	653	557	567	323	316	586	684	447	6798
1947	450	568	703	704	653	708	527	322	316	586	635	382	6554
1948	460	488	448	689	614	711	678	383	376	586	715	578	6725
1949	464	521	660	714	558	709	600	379	315	585	542	409	6456
1950	436	457	443	717	652	711	678	379	316	586	715	517	6609
1951	547	663	702	718	653	579	575	384	316	586	715	608	7048
1952	429	664	703	718	653	615	559	384	376	496	540	687	6823
1953	693	664	703	718	449	484	571	384	376	586	715	549	6892
1954	662	664	650	716	653	636	575	375	316	586	715	616	7166
1955	448	660	702	718	589	615	614	379	316	586	641	409	6676
1956	429	507	703	718	653	669	594	384	376	507	612	639	6790
1957	693	664	483	718	653	661	575	384	316	586	715	609	7058
1958	693	664	703	718	653	539	558	384	376	444	621	687	7040
1959	693	664	579	718	612	534	549	323	316	586	715	469	6759
1960	424	643	499	586	653	698	677	379	315	585	658	410	6529
1961	410	523	688	610	653	709	449	345	315	585	566	412	6264
1962	386	447	672	499	652	694	611	324	316	586	632	429	6247
1963	693	664	702	695	457	547	556	384	316	586	711	530	6841
1964	604	664	674	718	566	622	621	322	315	585	705	378	6775
1965	393	615	702	718	653	599	575	384	316	586	674	530	6745
1966	693	664	703	718	651	528	567	323	316	586	715	573	7037
1967	431	664	703	718	653	566	503	384	376	586	450	687	6720
1968	693	664	703	718	412	469	551	323	316	586	715	473	6624
1969	428	658	700	718	653	593	464	384	376	357	581	687	6600
1970	693	664	703	718	390	477	554	374	316	586	715	532	6723
1971	426	664	703	718	653	713	659	384	376	586	715	549	7147
1972	693	664	702	718	653	550	565	323	316	586	715	611	7098
1973	508	664	702	718	653	698	584	384	316	586	641	530	6984
1974	511	664	703	718	653	702	593	384	376	473	621	687	7085
1975	693	664	703	718	489	539	571	384	376	586	710	658	7091
1976	693	664	703	565	647	550	503	324	315	506	503	289	6261
1977	332	582	507	473	406	199	213	189	119	110	193	194	3517
1978	156	312	667	717	355	389	437	384	265	426	612	530	5250
1979	656	642	423	718	653	713	678	384	316	586	703	578	7051
1980	542	664	703	718	653	568	458	384	316	435	612	530	6582
1981	693	664	703	718	653	538	549	323	316	586	715	452	6910
1982	380	664	699	718	653	706	600	384	376	479	611	687	6957
1983	693	664	703	704	381	342	422	384	376	586	715	687	6657
1984	693	511	503	279	286	435	552	384	316	586	715	634	5895
1985	693	664	703	718	624	536	552	323	316	586	715	484	6916
1986	406	590	703	712	653	615	605	384	376	460	611	575	6690
1987	693	425	611	705	650	713	513	322	316	586	574	384	6494
1988	306	445	698	705	520	454	472	321	315	584	406	342	5570
1989	385	434	448	522	412	710	677	322	315	585	714	686	6211
1990	479	393	546	680	538	520	337	322	313	504	215	306	5154
1991	284	381	421	406	407	688	530	382	313	479	272	361	4922
AVG	500	577	638	680	590	594	553	356	323	525	600	499	6433

Difference in Total Delta Exports (Banks+North Bay Aqueduct+Tracy+Contra Costa Canal) (TAF)
Existing Level of Demand; Preferred Alternative Minus No-Action; D-1485 100BW-100BH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	0	-3	-1	12	-1	6	-5	0	4	12	2	1	27
1923	-15	0	0	0	0	8	2	0	7	1	1	0	4
1924	1	0	-1	0	0	0	-8	-5	-4	-9	-10	-9	-45
1925	0	0	0	0	0	6	0	0	12	12	8	9	47
1926	0	-1	-2	0	8	1	-6	0	7	1	1	0	9
1927	0	0	1	0	-1	0	-5	0	7	1	1	1	5
1928	1	0	0	0	0	0	-6	0	7	1	1	0	4
1929	1	-2	-2	0	0	0	-8	0	-1	-7	-5	0	-24
1930	-17	-8	0	0	11	6	-2	0	12	13	12	4	31
1931	0	0	-1	0	0	0	0	0	-1	0	0	0	-2
1932	0	0	-1	5	-40	0	-1	-2	12	9	0	0	-18
1933	-1	-8	0	0	0	0	0	-1	0	-7	0	0	-17
1934	0	-1	4	0	-22	0	0	0	0	0	0	0	-19
1935	0	0	0	0	0	0	0	0	12	12	12	4	40
1936	10	-1	-1	0	-1	5	-5	0	7	0	2	-4	12
1937	1	-2	-1	0	-1	-3	-5	0	10	1	1	0	1
1938	0	-2	2	0	-2	1	-6	0	7	0	2	1	3
1939	1	0	0	0	0	0	-9	0	0	-5	-3	-1	-17
1940	-3	-3	-1	-2	-3	0	0	0	12	12	13	0	25
1941	0	-1	0	-1	-2	-1	-5	0	6	1	1	1	-1
1942	1	0	0	0	0	0	-5	0	7	1	1	-1	4
1943	1	0	0	0	2	0	-5	0	7	2	1	1	9
1944	0	0	0	0	0	0	-5	0	7	1	1	0	4
1945	-1	-4	5	0	0	-1	-6	0	7	1	1	-1	1
1946	0	0	1	0	0	-1	-5	0	8	1	1	4	9
1947	1	-2	-1	4	0	0	-5	0	7	1	-2	0	3
1948	0	-3	-2	0	0	0	-6	0	12	3	1	0	5
1949	1	-3	2	0	-1	1	-6	0	7	1	0	0	2
1950	0	-2	-2	-2	9	0	-6	0	7	1	1	-3	3
1951	1	0	0	0	0	-1	-5	0	7	1	1	0	4
1952	0	0	0	-2	1	0	-5	0	7	0	2	1	4
1953	1	0	0	0	0	0	-5	-6	0	12	2	1	5
1954	-5	0	0	0	0	6	-5	0	7	1	1	1	6
1955	0	-5	0	0	0	2	-3	0	7	1	-1	0	1
1956	0	1	0	-4	0	5	-10	0	0	8	1	-5	-4
1957	1	0	0	0	0	6	-5	0	7	1	1	0	11
1958	1	0	0	0	-3	-4	-5	0	6	0	1	1	-3
1959	1	0	-1	0	2	0	-5	-6	1	12	2	0	6
1960	0	1	-2	0	0	4	-5	0	8	1	0	1	8
1961	0	-3	-1	0	4	0	-5	-6	0	12	0	0	1
1962	0	-4	-2	0	-2	7	-6	0	10	0	2	1	6
1963	1	0	0	1	0	0	-5	0	6	0	1	1	5
1964	3	0	0	0	0	-1	-7	0	8	0	3	0	6
1965	0	-2	5	0	0	0	-5	0	-1	9	0	2	8
1966	1	0	0	0	0	0	-5	0	8	0	2	1	7
1967	0	-1	0	-2	0	0	-6	0	6	0	1	1	-1
1968	1	0	0	0	0	0	-6	0	7	1	0	1	4
1969	1	-1	1	-1	0	0	-6	0	7	0	0	1	2
1970	1	0	0	-3	1	3	-5	0	8	0	2	1	8
1971	0	0	0	0	0	1	-5	0	-1	9	1	1	6
1972	1	0	0	0	0	0	-5	0	8	0	2	1	7
1973	1	0	0	0	-2	1	-5	0	7	0	1	1	4
1974	1	0	0	0	0	0	-5	0	-1	9	1	1	6
1975	1	0	0	0	0	0	-5	0	7	0	1	-1	3
1976	1	0	0	0	0	2	-8	-6	-1	-9	-4	-1	-26
1977	-8	-5	-4	0	0	0	0	0	0	0	0	7	-10
1978	0	-7	0	0	0	0	0	0	0	12	12	12	29
1979	-21	-9	42	-1	-1	7	-5	0	12	1	2	0	27
1980	-6	0	2	0	0	6	-6	0	0	8	1	1	6
1981	1	0	0	0	0	0	-6	0	8	1	1	0	5
1982	0	0	1	0	0	-2	-5	0	8	0	2	1	5
1983	1	0	0	0	0	0	-5	0	6	1	1	1	5
1984	1	-2	2	0	0	0	-5	0	8	1	1	-2	4
1985	1	0	0	0	3	0	-5	0	8	1	1	0	9
1986	1	-3	0	5	-3	2	-5	0	0	7	2	1	7
1987	1	-2	2	1	0	5	-6	-5	-4	-3	-8	1	-18
1988	-3	-5	-1	2	13	5	-5	1	-3	-9	-10	0	-15
1989	1	1	1	1	3	6	0	0	12	12	13	12	62
1990	4	0	-1	0	0	0	-10	0	0	-4	-4	-9	-24
1991	-1	-22	-7	0	-1	0	0	0	0	4	0	0	-27
AVG	-0	-2	1	0	-0	1	-5	-1	5	2	1	1	4

Total Delta Exports (Banks+North Bay Aqueduct+Tracy+Contra Costa Canal) (TAF)
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS OCAP 80

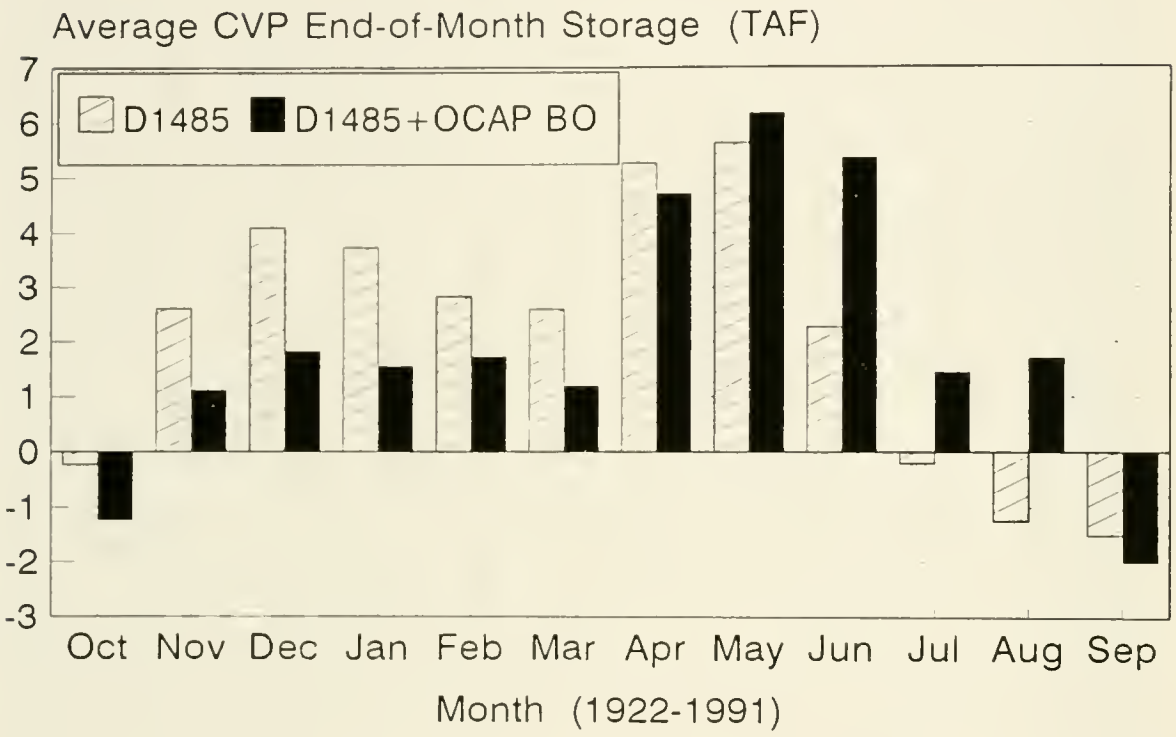
167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	408	435	702	718	653	713	317	171	302	398	597	687	6101
1923	693	664	703	718	569	306	317	171	272	398	545	687	6043
1924	574	466	626	576	285	192	179	266	280	353	325	232	4356
1925	264	424	560	497	652	343	316	170	271	397	553	686	5134
1926	433	428	456	646	589	264	262	266	301	368	514	685	5212
1927	512	662	698	589	652	593	317	171	272	398	586	687	6138
1928	677	664	702	525	505	713	317	171	272	398	554	686	6182
1929	538	515	570	604	338	274	203	282	210	282	312	340	4468
1930	353	363	614	490	338	506	262	283	195	303	519	352	4579
1931	334	305	317	599	304	231	202	283	211	259	202	299	3546
1932	319	347	700	705	611	235	246	284	301	385	521	492	5147
1933	338	399	432	656	292	288	238	282	247	341	519	378	4412
1934	300	291	620	705	405	247	205	282	121	94	305	347	3922
1935	258	471	447	622	321	624	317	171	272	398	568	687	5155
1936	673	481	530	718	653	548	316	171	272	398	566	686	6012
1937	608	440	504	696	653	687	317	171	272	398	554	687	5985
1938	652	515	702	718	653	670	441	291	302	398	622	687	6651
1939	693	664	687	678	403	312	223	282	286	358	525	687	5799
1940	444	383	480	684	647	667	464	171	272	398	578	687	5875
1941	663	523	703	718	653	661	464	171	302	398	622	687	6565
1942	693	664	703	718	653	512	356	171	302	398	617	687	6474
1943	693	664	651	718	653	713	317	171	272	398	583	687	6522
1944	693	577	614	662	621	415	226	284	302	371	523	672	5960
1945	404	663	702	705	639	559	297	171	272	398	554	686	6051
1946	632	663	702	718	497	443	317	171	272	398	559	687	6060
1947	504	526	703	584	418	358	233	266	301	369	506	637	5407
1948	434	466	427	574	218	340	316	170	301	397	535	686	4867
1949	693	594	582	541	286	709	262	283	301	369	508	573	5700
1950	424	447	428	534	559	387	316	171	272	397	530	686	5153
1951	693	663	702	718	604	520	317	171	272	398	564	687	6310
1952	623	664	703	718	653	592	441	291	302	398	615	687	6686
1953	693	664	703	718	506	388	317	171	295	398	556	687	6095
1954	693	664	617	514	636	648	317	171	272	398	538	687	6156
1955	693	642	543	620	308	271	222	284	301	364	511	686	5445
1956	464	491	702	718	599	554	317	171	302	398	564	687	5968
1957	693	641	607	638	602	671	262	171	272	398	514	687	6157
1958	693	664	544	718	653	713	464	171	302	398	581	687	6590
1959	693	664	619	675	653	327	216	284	302	358	505	687	5984
1960	553	429	489	567	475	394	196	170	271	379	501	685	5110
1961	481	510	689	581	426	315	199	282	300	358	491	577	5211
1962	375	438	640	502	652	366	245	171	272	397	499	594	5151
1963	693	663	532	484	525	501	464	171	272	398	549	687	5939
1964	693	561	636	539	253	222	204	283	301	359	494	685	5232
1965	369	588	702	717	546	385	317	171	272	398	605	687	5758
1966	693	664	703	718	545	395	275	171	272	375	517	687	6015
1967	626	664	703	718	620	581	376	291	302	398	578	687	6544
1968	693	664	703	602	653	539	249	171	272	373	536	687	6142
1969	538	594	525	718	653	645	317	291	302	398	580	687	6250
1970	693	664	703	718	653	605	276	171	272	398	550	687	6390
1971	645	586	703	718	442	704	317	171	302	398	555	687	6228
1972	693	624	702	703	416	460	241	171	272	369	504	687	5844
1973	693	664	563	718	653	712	317	171	272	398	551	687	6400
1974	693	664	703	718	653	713	464	171	302	398	560	687	6727
1975	693	664	703	663	653	713	317	171	302	398	553	687	6517
1976	693	664	703	523	274	260	181	267	280	330	492	454	5120
1977	296	347	406	416	149	186	192	281	170	91	273	210	3016
1978	156	180	579	717	622	464	317	171	272	398	572	687	5135
1979	693	639	493	642	653	713	317	171	272	362	520	687	6165
1980	693	664	703	718	653	713	317	171	272	398	573	687	6563
1981	693	664	703	555	457	573	257	268	302	361	518	687	6038
1982	534	595	699	718	653	658	441	291	302	398	667	687	6643
1983	693	664	703	718	653	440	435	291	302	398	715	687	6700
1984	693	602	508	453	340	460	317	171	272	398	605	687	5507
1985	693	664	703	694	437	443	263	268	302	366	523	687	6043
1986	527	530	703	508	653	571	317	171	302	398	610	687	5978
1987	693	572	599	554	335	467	229	275	286	359	526	518	5413
1988	270	308	656	492	169	173	189	282	279	339	504	475	4136
1989	341	390	420	482	148	664	262	266	301	368	515	584	4742
1990	410	296	389	603	224	232	196	281	276	335	501	445	4188
1991	296	277	325	391	149	452	226	282	290	363	498	441	3991
AVG	558	545	610	632	505	485	295	220	279	371	531	623	5652

Difference in Total Delta Exports (Banks+North Bay Aqueduct+Tracy+Contra Costa Canal) (TAF)
Existing Level of Demand, Preferred Alternative Minus No-Action; D-1485+NMFS+USFWS OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1922	0	-2	0	12	-1	6	0	0	0	0	0	12	27
1923	11	0	0	0	0	0	0	0	0	0	0	10	21
1924	1	0	0	0	0	0	0	0	0	0	-24	0	-23
1925	-20	-5	0	0	0	0	0	0	0	0	0	12	-13
1926	11	0	0	0	-1	0	0	0	0	0	0	0	10
1927	0	0	-1	0	0	0	0	0	0	0	0	12	11
1928	-5	0	0	0	0	0	0	0	0	0	0	3	-2
1929	0	0	0	0	0	0	0	0	0	0	-16	-1	-17
1930	-22	-7	9	0	0	0	0	0	0	0	0	-4	-24
1931	0	0	0	0	0	0	0	0	0	0	0	0	0
1932	-4	0	0	0	0	0	0	0	0	0	0	11	7
1933	12	0	0	0	-2	0	0	0	-30	22	-4	-21	-23
1934	0	0	5	0	0	0	0	0	0	0	-2	0	3
1935	0	0	0	0	1	0	0	0	0	0	0	12	13
1936	10	11	0	0	-2	0	0	0	0	0	0	12	31
1937	10	2	0	0	-2	-5	0	0	0	0	0	11	16
1938	9	-5	0	0	-2	2	-7	-3	0	0	0	12	6
1939	10	0	-1	0	0	0	0	0	0	0	1	-3	7
1940	4	0	0	0	-4	-4	-2	0	0	0	0	12	6
1941	12	8	0	-2	-3	-1	-4	0	0	0	0	9	19
1942	1	0	0	0	0	0	0	0	0	0	0	9	10
1943	1	0	-1	0	0	0	0	0	0	0	0	3	3
1944	1	0	0	0	0	0	0	0	0	0	0	3	4
1945	0	0	13	0	9	0	0	0	0	0	0	12	34
1946	0	0	0	0	0	0	0	0	0	0	0	12	12
1947	13	0	0	0	0	0	0	0	0	0	0	0	13
1948	0	0	0	0	0	0	0	0	0	0	0	12	12
1949	12	-8	-1	0	0	0	0	0	0	0	0	0	3
1950	0	0	-2	0	0	0	0	0	0	0	0	12	10
1951	7	1	0	0	-17	42	0	0	0	0	0	12	45
1952	1	0	0	-2	2	0	-7	-3	0	0	0	12	3
1953	10	0	0	0	0	0	0	0	0	0	0	12	22
1954	10	0	0	-2	0	0	0	0	0	0	0	3	11
1955	1	-1	0	0	0	0	0	0	0	0	0	0	0
1956	0	0	0	-5	-1	0	0	0	0	0	0	12	6
1957	13	0	0	0	0	0	0	0	0	0	0	9	22
1958	1	0	0	0	-3	-2	-4	0	0	0	0	8	0
1959	1	0	0	0	0	0	0	0	0	0	0	0	1
1960	0	0	1	0	0	0	0	0	0	0	0	10	11
1961	2	-2	-1	0	0	0	0	0	0	0	0	0	-1
1962	0	-3	1	0	-3	0	0	0	0	0	0	10	5
1963	10	0	0	-1	1	0	-4	0	0	0	0	12	18
1964	3	0	0	0	0	0	0	0	0	0	0	0	3
1965	3	0	12	7	0	0	0	0	0	0	0	12	34
1966	4	0	0	0	0	0	0	0	0	0	0	11	15
1967	5	0	0	-2	0	0	0	-3	0	0	0	12	12
1968	9	0	0	0	0	0	0	0	0	0	0	3	12
1969	1	0	0	-1	0	0	0	-3	0	0	0	12	9
1970	10	0	0	-3	2	-13	0	0	0	0	0	10	6
1971	-5	0	0	0	0	0	0	0	0	0	0	10	5
1972	1	0	0	0	0	0	0	0	0	0	0	10	11
1973	1	0	0	0	-2	1	0	0	0	0	0	12	12
1974	4	0	0	0	0	1	-4	0	0	0	0	12	13
1975	6	0	0	0	0	0	0	0	0	0	0	9	15
1976	1	0	0	0	0	0	0	0	0	0	0	-22	-21
1977	0	-6	-7	-6	0	0	0	0	0	0	0	0	-19
1978	0	0	0	0	-8	0	0	0	0	0	0	12	4
1979	13	0	-16	1	0	7	0	0	0	0	0	0	5
1980	0	12	12	0	0	0	0	0	0	0	0	12	36
1981	3	0	0	0	0	-2	0	0	0	0	0	0	1
1982	1	0	11	0	0	-2	-7	0	0	0	0	10	13
1983	1	0	0	0	0	1	-5	0	0	0	8	1	6
1984	1	-1	1	0	0	0	0	0	0	0	0	11	12
1985	1	0	0	0	0	0	0	0	0	0	0	0	1
1986	0	-3	0	0	-3	6	0	0	0	0	0	12	12
1987	7	-4	0	0	0	0	0	0	0	0	-1	0	2
1988	0	-2	0	0	0	0	0	0	0	0	0	0	-2
1989	0	-7	0	1	0	1	0	0	0	0	0	10	5
1990	12	1	0	0	0	0	0	0	0	0	0	0	13
1991	0	-1	0	0	0	0	0	0	0	0	0	0	-1
AVG	3	-0	1	-0	-1	1	-1	-0	-0	0	-1	6	8

Change in CVP EOM Storage
Relative to No-Action Case
Existing Demands, D1485 and D1485 with OCAP BO



CCWD rad 09/15/93

Total End-of-Month Storage in CVP Reservoirs (TAF)
(Clair Engle, Whiskeytown, Shasta, Keswick, Folsom, San Luis)
Existing Level of Demand, No-Action; D-1485 100bH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	5616	5726	6064	6366	6877	7515	8413	8812	8402	7505	6671	6481
1923	6389	6195	6380	6789	7119	7489	8167	7977	7270	6200	5269	5114
1924	5106	5094	5040	5226	5629	5616	5318	4821	4151	3355	2774	2588
1925	2617	2820	3131	3546	5615	6259	7475	7653	6859	5677	4766	4610
1926	4550	4613	4696	4913	6129	6644	7430	7049	6069	4881	3915	3681
1927	3657	4560	5442	6242	6399	7448	8153	8379	7972	6945	6056	5852
1928	5844	5981	6166	6676	7388	7547	8436	8401	7433	6182	5210	4988
1929	4895	5033	5153	5392	5804	6210	6274	6155	5773	4855	4186	3999
1930	3930	3876	4785	5270	5997	6873	7251	6948	6049	4816	3778	3596
1931	3500	3518	3467	3781	4053	4375	4240	3938	3491	2832	2363	2240
1932	2199	2244	2816	3349	3700	4311	4465	4733	4225	3127	2307	2092
1933	1949	1881	1883	2192	2446	3256	3646	3832	3761	3142	2665	2568
1934	2549	2560	2922	3564	4205	4774	4943	4667	4187	3530	3054	2918
1935	2878	3206	3454	3966	4426	5132	6509	6902	6310	5143	4159	3903
1936	3852	3846	3840	5064	5842	6531	7176	7119	6708	5558	4571	4334
1937	4184	4080	4106	4258	4662	5587	6764	7229	6910	5835	4917	4696
1938	4699	5146	5471	6078	6282	6484	7593	8522	8495	7849	7085	6709
1939	6255	6068	6267	6580	6850	7562	7411	6915	6082	4949	3994	3776
1940	3657	3494	3573	5175	6327	6948	8207	8394	7586	6406	5435	5257
1941	5279	5394	6247	6644	7157	8180	8975	9167	8942	8162	7401	7223
1942	6880	6575	6781	7064	7419	8105	8949	9120	8895	8054	7267	7115
1943	6747	6571	6654	7093	7666	8223	8988	9047	8406	7306	6442	6249
1944	6281	6406	6454	6727	7256	7866	7865	7761	7102	5967	5028	4815
1945	4747	5184	5734	6198	7344	7931	8356	8439	7831	6710	5788	5560
1946	5690	6033	6287	6934	7448	8135	8653	8687	7877	6728	5795	5618
1947	5542	5814	6066	6262	6762	7626	7889	7311	6705	5556	4633	4412
1948	4522	4678	4693	5689	5911	6287	7839	8388	8217	7232	6287	6098
1949	6057	6047	6186	6364	6744	7616	8270	8414	7623	6466	5556	5369
1950	5247	5275	5254	5930	6564	7342	7986	7920	7244	6217	5374	5207
1951	5543	6093	6476	7027	7592	8353	8750	8935	8231	7040	6138	6006
1952	6077	6377	6611	7127	7594	8124	8809	9184	8998	8466	7807	7415
1953	6897	6690	6757	7155	7742	8458	8970	9052	8738	7985	7203	7099
1954	6799	6582	6669	7094	7507	8303	9041	8996	8192	7048	6253	6133
1955	6168	6381	6645	7003	7346	7616	7718	7815	7099	5961	5054	4909
1956	4814	4941	6377	6871	7144	8172	9067	9167	8942	8159	7437	7137
1957	6752	6555	6668	6954	7430	8219	8589	8986	8510	7546	6750	6654
1958	6640	6575	6640	7143	8784	7765	8692	9167	8981	8371	7702	7303
1959	6819	6583	6675	7287	7615	8377	8522	8260	7473	6374	5487	5433
1960	5346	5233	5180	5631	6908	8001	8155	8121	7375	6204	5223	5040
1961	4952	5165	5756	6178	7283	7950	8155	8086	7509	6336	5415	5246
1962	5123	5204	5628	5948	7135	7975	8581	8437	7842	6716	5863	5716
1963	6429	6278	6599	7003	7796	8274	8556	9071	8575	7593	6772	6665
1964	6567	6582	6671	7242	7642	7850	7665	7345	6734	5598	4680	4504
1965	4407	4734	6558	7048	7759	8245	8870	9058	8511	7538	6886	6781
1966	6633	6556	6677	7284	7820	8354	9005	8952	8109	7039	6161	5969
1967	5846	6374	6665	7149	7815	8150	8847	9184	8966	8475	7801	7410
1968	6931	6723	6815	7301	7569	8406	8530	8293	7460	6347	5692	5551
1969	5572	5800	6421	6818	7202	8066	8908	9184	8998	8487	7762	7352
1970	6890	6705	6869	7448	7646	8580	8578	8514	7877	6848	6034	5895
1971	5922	6529	6624	7197	7817	8070	8930	9051	8737	7980	7215	7029
1972	6722	6549	6663	7275	7812	8576	8875	8720	7902	6809	6013	5875
1973	5934	6346	6651	7169	7476	8286	8956	9144	8282	7149	6360	6244
1974	6418	6765	6949	7367	7896	7765	8803	9179	8993	8368	7685	7284
1975	6794	6591	6688	7031	7677	7830	8859	9052	8763	8079	7411	7128
1976	6777	6575	6670	6932	6924	7362	7419	7182	6545	5605	5014	4922
1977	4882	4786	4646	4687	4650	4589	4309	4053	3520	2880	2497	2504
1978	2461	2526	3346	5792	6441	7234	8121	8397	8162	7168	6345	6343
1979	6116	6001	6033	6407	6958	7837	8250	8494	7727	6728	5966	5792
1980	5916	5958	6192	6742	6946	8027	8775	8962	8394	7583	6787	6749
1981	6487	6294	6510	7117	7749	8238	8605	8172	7282	6160	5302	5123
1982	5162	6346	6618	7173	7359	8074	8613	9184	8998	8389	7719	7327
1983	6846	6649	6761	7131	7286	8281	8593	9184	8998	8616	8089	7804
1984	7319	7098	7384	7713	8004	8485	9008	9058	8611	7645	7041	6914
1985	6613	6575	6658	6988	7390	7877	8230	7741	6798	5730	4859	4739
1986	4690	4779	5170	6259	6980	7726	8508	8672	8115	7093	6267	6304
1987	6349	6408	6509	6799	7422	8305	8312	7789	6826	5642	4724	4522
1988	4384	4393	5239	6059	6400	6526	6530	6208	5564	4386	3524	3298
1989	3150	3436	3602	3916	4112	6376	7293	6974	6123	4962	4139	4065
1990	4217	4463	4449	5012	5333	5854	5745	5655	5289	4295	3666	3519
1991	3461	3447	3397	3450	3487	4383	4843	4796	4369	3832	3329	3192
AVE	5331	5408	5673	6175	6707	7326	7846	7888	7338	6377	5583	5399

Change in End-of-Month Storage in CVP Reservoirs (TAF)
(Clair Engle, Whiskeytown, Shasta, Keswick, Folsom, San Luis)
Existing Level of Demand, No-Action; D-1485

100bW-100bH

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	3	4	2	1	1	1	0	0	-19	-21	-21
1923	0	0	0	-1	0	0	0	-1	-7	-9	-10	-11
1924	-12	-11	-10	-9	-9	-10	-1	5	9	18	28	43
1925	43	43	43	43	42	36	38	38	26	8	-2	-17
1926	-17	-16	-15	-15	-15	-14	-10	-10	-17	-19	-20	-20
1927	-20	-20	-20	1	1	1	1	1	-6	-7	-8	-9
1928	-9	1	1	1	1	1	1	1	-6	-7	-9	-9
1929	-10	-9	-6	-6	-5	-6	3	3	3	12	21	29
1930	38	46	46	46	46	41	42	41	30	13	14	6
1931	5	6	8	8	8	8	16	19	22	28	37	47
1932	54	54	54	47	7	7	8	8	8	-1	-1	-1
1933	3	7	8	7	8	8	17	17	20	28	31	31
1934	30	30	29	30	7	7	7	7	7	7	7	7
1935	7	7	7	7	7	7	7	8	7	-11	-26	-38
1936	-53	-53	-52	-48	0	0	0	0	0	0	-2	-3
1937	-3	-3	-2	-1	-1	-1	-1	-1	-10	-11	-13	-12
1938	-12	0	0	0	0	0	0	0	0	-1	-2	-1
1939	0	0	0	0	0	0	8	8	9	15	17	18
1940	21	23	25	24	2	2	2	3	-10	-27	-43	-43
1941	-43	-43	1	1	1	1	0	0	0	-1	-2	0
1942	0	0	0	0	0	0	0	0	0	-1	-2	-1
1943	0	0	0	0	0	0	0	0	-7	-8	-10	-10
1944	-9	-8	-7	-7	-7	-6	0	1	-7	-8	-9	-9
1945	-8	-8	8	7	0	-1	4	5	-3	-4	-5	-6
1946	-5	-1	-1	-1	-1	-1	-1	-1	-8	-10	-11	-13
1947	-14	-10	-6	-7	-7	-7	-2	-1	-9	-9	-10	-11
1948	-10	-7	-5	-3	-4	-3	-4	-2	-3	-4	-5	-6
1949	-6	-3	-1	-1	-1	-3	5	4	-2	-4	-4	-4
1950	-4	-2	1	-1	0	0	-1	0	0	-2	-3	-2
1951	-3	-1	-2	-1	-1	-1	-2	-2	-6	-8	-9	-10
1952	-11	-2	0	0	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	-13	-14	-14
1954	-8	0	0	0	0	0	0	0	-8	-9	-10	-10
1955	-11	-3	-3	0	0	0	6	6	-1	-2	-3	-3
1956	-3	4	0	-1	0	0	0	0	0	-8	-9	-2
1957	-1	0	0	0	0	0	9	1	-6	-7	-9	-9
1958	-3	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	7	13	12	-4	-5	-4
1960	-5	-5	-2	-3	-2	-2	5	4	-3	-5	-5	-6
1961	-6	-2	-1	-1	0	0	5	11	11	-4	-5	-5
1962	-6	-2	1	1	1	1	9	8	-1	-1	-4	-5
1963	1	1	2	1	0	0	0	0	-6	-5	-7	-9
1964	-12	0	0	0	0	1	7	8	-1	-1	-2	-2
1965	-2	1	0	0	0	0	0	0	1	-8	-7	-10
1966	-3	0	0	0	0	0	5	5	-2	-2	-4	-6
1967	-6	-5	-1	-1	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	6	5	-2	-3	-4	-5
1969	-5	-3	-3	0	0	0	0	0	0	0	-2	-2
1970	-2	-2	-2	-2	0	0	6	6	-2	-2	-4	-5
1971	-6	0	0	0	0	0	0	0	0	-9	-10	-3
1972	-3	0	0	0	0	0	7	7	-1	0	-3	-3
1973	-3	-1	0	0	0	0	0	0	-8	-7	-9	-11
1974	-12	-2	-1	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	-1	-1
1976	0	0	0	0	0	0	12	18	19	31	35	38
1977	45	52	58	58	58	58	58	58	57	57	56	56
1978	56	56	56	11	11	11	12	12	11	-1	-17	-31
1979	-1	12	12	12	11	11	11	11	0	-3	-4	-4
1980	7	11	12	11	12	11	11	11	11	3	3	3
1981	9	11	10	11	10	11	16	17	8	7	5	5
1982	6	6	6	6	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	-2	-3	0
1985	-1	0	0	0	0	0	6	5	-2	-4	-5	-5
1986	-5	0	0	-1	0	0	-1	-1	0	-1	-2	-2
1987	-2	0	-2	-1	-1	0	5	10	13	17	20	19
1988	22	27	26	26	10	5	12	11	14	22	31	32
1989	31	31	28	27	24	24	24	23	12	-5	-18	-31
1990	-36	-36	-36	-36	-36	-36	-27	-27	-27	-21	-17	-13
1991	-3	9	19	20	20	20	20	21	20	18	18	18
AVE	-0.2	2.6	4.1	3.7	2.8	2.6	5.3	5.6	2.3	-0.2	-1.2	-1.5

Total End-of-Month Storage in CVP Reservoirs (TAF)
(Clair Engle, Whiskeytown, Shasta, Keswick, Folsom, San Luis)
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS CVP-OCAP BO 167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	5616	5743	6081	6375	6885	7464	8239	8575	8122	7281	6705	6500
1923	6205	6005	6189	6598	6915	7160	7789	7582	6952	6121	5514	5398
1924	5398	5430	5439	5602	5909	5851	5564	5085	4466	3745	3211	3063
1925	3114	3342	3678	4104	6056	6521	7557	7599	6760	5884	5246	4994
1926	4938	5003	5091	5307	6432	6746	7407	7033	6094	5155	4520	4210
1927	4189	5109	5765	6348	6522	7502	8105	8219	7809	6882	6270	6034
1928	5918	6052	6252	6709	7381	7591	8429	8367	7487	6459	5651	5436
1929	5352	5520	5718	5943	6276	6587	6729	6655	6326	5593	5007	4831
1930	4784	4753	5639	5999	6577	7360	7704	7492	6769	5845	5036	4942
1931	4905	4976	5006	5289	5492	5756	5559	5197	4709	4038	3552	3405
1932	3364	3409	3904	4380	4800	5360	5401	5576	5015	4048	3427	3170
1933	3035	2983	3000	3189	3216	4008	4411	4594	4497	3855	3249	3117
1934	3098	3109	3431	4016	4561	5018	5139	4825	4314	3654	3119	2950
1935	2911	3231	3465	4082	4540	5186	6466	6754	6127	5160	4488	4222
1936	4103	4104	4148	5209	5852	6443	6992	6880	6464	5418	4744	4497
1937	4295	4244	4287	4465	4790	5629	6683	7036	6661	5587	4964	4669
1938	4613	5095	5419	6027	6230	6487	7596	8473	8403	7704	6931	6554
1939	6105	5918	6126	6449	6632	7218	7114	6638	5885	5193	4556	4267
1940	4179	4096	4213	5822	6448	7023	8232	8337	7471	6427	5761	5564
1941	5530	5673	6293	6690	7203	8226	8942	9022	8754	7975	7396	7098
1942	6703	6391	6596	6879	7232	7782	8576	8642	8375	7845	7295	7001
1943	6571	6391	6464	6904	7468	8064	8706	8654	8015	7167	6567	6342
1944	6351	6300	6380	6647	7180	7644	7652	7534	6903	6122	5476	5178
1945	5127	5562	6061	6512	7422	7883	8273	8279	7639	6711	6106	5833
1946	5969	6049	6314	6965	7443	8015	8449	8493	7639	6626	6002	5759
1947	5674	5951	6184	6353	6780	7487	7747	7229	6675	5794	5183	4898
1948	5034	5211	5259	6252	6409	6872	7911	8116	7994	7286	6672	6500
1949	6175	5990	6141	6289	6563	7443	8128	8249	7469	6710	6093	5852
1950	5741	5779	5773	6289	6916	7547	8118	8000	7364	6536	5960	5798
1951	6081	6160	6575	7142	7678	8358	8645	8783	8059	7089	6504	6366
1952	6352	6439	6625	7145	7617	8124	8809	9132	8902	8269	7552	7162
1953	6646	6439	6506	6904	7492	8143	8562	8550	8313	7931	7472	7090
1954	6651	6411	6487	6859	7290	8085	8721	8591	7765	7024	6564	6444
1955	6277	6412	6589	6917	7149	7344	7602	7764	7110	6362	5766	5582
1956	5513	5673	6430	6940	7166	8149	8947	8938	8670	7903	7435	7029
1957	6573	6374	6457	6736	7212	8006	8484	8584	8096	7520	7034	6886
1958	6638	6432	6465	6976	8625	7617	8508	8871	8643	7974	7506	7110
1959	6627	6391	6465	7085	7412	8002	8214	7962	7225	6544	5995	5933
1960	5836	5796	5776	6179	7369	7999	8226	8214	7524	6667	6014	5795
1961	5732	5978	6358	6750	7452	7982	8291	8247	7677	6869	6257	6024
1962	5909	5999	6346	6661	7314	7979	8477	8330	7713	6804	6263	6066
1963	6584	6442	6626	6964	7796	8227	8459	8862	8367	7500	7008	6841
1964	6512	6355	6433	6957	7214	7379	7192	6929	6457	5791	5215	5006
1965	4954	5326	6626	7143	7785	8128	8684	8760	8214	7403	7015	6877
1966	6492	6394	6492	7099	7611	8068	8650	8534	7716	7087	6554	6355
1967	6190	6509	6731	7224	7838	8150	8826	9111	8850	8258	7511	7122
1968	6645	6437	6529	6993	7337	8208	8328	8019	7197	6501	6174	6004
1969	6003	6206	6471	6785	7179	8080	8872	9082	8852	8240	7494	7086
1970	6636	6451	6615	7195	7507	8542	8557	8424	7783	6986	6501	6345
1971	6257	6539	6625	7193	7754	8026	8782	8813	8488	7927	7433	7024
1972	6587	6397	6509	7146	7612	8326	8702	8614	7876	7135	6692	6581
1973	6373	6426	6565	7103	7437	8285	8832	8908	8047	6985	6495	6346
1974	6326	6651	6835	7236	7765	7676	8664	8929	8700	7974	7478	7079
1975	6590	6388	6485	6831	7476	7777	8683	8764	8432	7950	7457	7050
1976	6600	6391	6485	6693	6551	6836	7020	6872	6340	5639	5169	5077
1977	5072	5090	5036	5109	5110	5084	4803	4612	4120	3561	3221	3254
1978	3229	3319	4188	5980	6621	7395	8232	8396	8117	7124	6479	6434
1979	6181	6077	6110	6496	7046	7889	8265	8400	7609	6818	6381	6183
1980	5984	5894	6130	6681	6886	8071	8769	8893	8326	7515	6911	6815
1981	6474	6266	6481	7048	7615	8082	8458	8074	7220	6483	5955	5756
1982	5775	6474	6772	7331	7494	8160	8613	9132	8902	8192	7486	7097
1983	6617	6419	6531	6901	7191	8281	8593	9132	8902	8420	7893	7609
1984	7125	6904	7195	7697	8004	8485	8885	8823	8334	7625	7306	6908
1985	6540	6391	6473	6819	7146	7513	7880	7457	6578	5857	5314	5190
1986	5150	5286	5699	6644	7017	7748	8519	8619	8085	7136	6372	6435
1987	6500	6419	6529	6812	7342	8175	8277	7811	6931	5973	5343	5110
1988	5003	5039	5924	6696	7026	7199	7208	6900	6321	5585	4967	4700
1989	4582	4913	5132	5447	5638	7326	8138	7870	7063	6180	5695	5636
1990	5816	6080	6130	6640	6802	7218	7014	6971	6605	5779	5203	4994
1991	4943	4943	4922	4982	4997	5755	6111	6022	5544	4953	4508	4316
AVE	5622	5662	5895	6369	6839	7396	7873	7869	7326	6548	5976	5754

Change in End-of-Month Storage in CVP Reservoirs (TAF)
(Clair Engle, Whiskeytown, Shasta, Keswick, Folsom, San Luis)
Existing Level of Demand, No-Action; D-1485+NMFS+USFWS CVP-OCAP BO 167E-167D

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1922	0	2	2	1	1	1	6	5	10	0	0	-14
1923	0	0	0	0	0	0	5	5	5	0	0	-12
1924	-12	-12	-12	-12	-13	-12	-4	2	4	4	23	33
1925	43	50	51	51	49	49	3	3	3	3	3	-7
1926	-20	-19	-19	-19	-12	-12	-7	-7	-7	-12	-12	-11
1927	-12	-11	3	5	5	3	3	3	-10	3	3	-12
1928	-2	3	2	3	2	2	7	8	1	1	2	-1
1929	-2	-2	-1	-2	-2	-2	7	7	7	7	26	36
1930	44	53	30	30	30	30	11	11	-1	-13	-13	-23
1931	-23	-21	-18	-18	-19	-19	-10	-9	-10	-9	-1	6
1932	6	6	6	6	2	1	1	1	1	1	1	-14
1933	-26	-25	-26	-25	-13	-12	-3	-4	-3	-19	-11	-3
1934	2	2	-13	-13	-13	-14	-14	-14	-14	-14	-12	-11
1935	-12	-12	-12	-12	-12	-12	-11	-12	-23	1	2	-13
1936	-23	-34	-34	-13	0	1	5	6	5	0	0	-15
1937	-24	-26	-26	-25	-11	-12	-7	-1	1	1	-13	-28
1938	-37	-3	-2	-3	-2	0	0	4	9	10	9	9
1939	8	8	8	8	7	7	16	16	16	0	-1	3
1940	2	3	3	6	4	0	2	2	2	0	0	-14
1941	-26	-38	0	0	0	0	4	4	3	4	0	0
1942	0	0	0	0	0	0	6	5	5	0	0	0
1943	0	0	-1	-1	0	-2	4	3	-4	0	0	-3
1944	-1	3	2	2	2	3	7	13	19	0	0	0
1945	-1	-1	0	-1	0	0	6	10	17	0	0	-10
1946	-10	0	0	0	0	0	5	11	10	0	0	-9
1947	-17	-17	-10	-11	-11	-10	-5	1	7	-10	-10	-10
1948	-10	-10	-10	-10	-10	-10	5	5	5	0	0	-14
1949	-2	14	13	13	13	13	19	24	29	0	0	0
1950	0	-1	3	2	2	3	8	8	-4	2	1	-13
1951	-2	17	18	17	0	0	5	11	16	0	0	-14
1952	-3	-1	0	0	0	0	0	4	10	10	10	10
1953	9	9	9	9	9	10	15	20	0	0	0	0
1954	0	0	0	-1	-1	-1	5	4	-3	0	0	-4
1955	-1	1	2	2	2	2	7	13	18	0	0	0
1956	0	0	0	0	0	0	5	5	5	0	0	0
1957	0	-10	-10	-10	-10	-10	-5	-5	-5	0	0	0
1958	0	0	0	0	0	0	3	4	3	0	0	0
1959	0	0	0	0	0	0	6	5	5	0	0	0
1960	0	0	0	1	0	1	5	6	-6	0	0	-9
1961	-9	-7	-2	-2	-2	-2	4	9	13	-1	-1	-1
1962	-1	2	0	0	1	0	4	4	-7	0	0	-9
1963	0	0	0	0	0	0	4	9	10	0	0	0
1964	-1	0	-1	-1	-1	0	5	10	2	0	0	6
1965	5	6	0	0	0	0	5	11	11	0	0	-14
1966	-1	-1	0	0	0	0	5	11	10	0	0	-13
1967	-17	-5	-1	-1	0	0	5	9	15	15	15	16
1968	15	15	15	16	15	14	19	20	12	0	0	-3
1969	-3	-1	0	0	0	0	6	9	15	15	15	15
1970	15	15	15	14	13	0	5	5	5	0	0	-12
1971	-6	-1	-1	0	0	0	5	5	5	0	0	0
1972	0	0	0	0	0	0	5	5	6	0	0	-13
1973	-3	0	0	0	0	0	6	11	10	0	0	-14
1974	-6	9	10	11	11	0	4	3	10	11	0	0
1975	0	0	0	0	0	-2	3	3	4	0	0	0
1976	0	0	0	0	0	0	9	9	14	15	21	27
1977	27	33	44	49	54	58	57	58	57	57	56	56
1978	56	56	56	20	12	12	12	12	12	12	12	1
1979	5	25	25	21	21	20	14	15	2	8	9	8
1980	7	7	7	7	8	7	12	12	17	17	7	11
1981	7	7	8	7	7	6	12	11	11	7	7	7
1982	7	7	7	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	-2	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	5	5	5	0	0	0
1985	0	0	0	0	0	0	5	5	5	0	0	0
1986	0	3	3	2	0	0	6	5	5	5	6	6
1987	5	5	5	6	5	2	10	11	11	8	2	1
1988	1	4	3	3	3	4	12	12	12	3	4	3
1989	4	11	17	19	19	9	9	9	10	0	0	-9
1990	-21	-20	-20	-22	-22	-22	-13	-13	-13	-21	-21	-21
1991	-20	-20	-20	-20	-20	-21	-20	-20	-20	-20	-20	-20
AVE	-1.2	1.1	1.8	1.6	1.7	1.2	4.7	6.2	5.4	1.4	1.7	-2.0

Los Vaqueros Project Performance Matrix

Scenario H40

D-1485 water quality standards only.
Existing level of development.

Scenario H40 and its no action base case were based on Central Valley flows from DWRSIM run 100bH (existing level of development, D1485 base case with new hydrology 1922-1992) and the corresponding FDM 6E salinities. CCWD diversions from scenario H40 were incorporated in DWRSIM run 100bW to determine the effect of the Los Vaqueros project on Central Valley operations. Reservoir filling was limited according to the operations rules in the NMFS Los Vaqueros project biological opinion on winter run salmon and the 2 ppt limitations in the USFWS Los Vaqueros Project biological opinion for Delta smelt.

Water Quality and Reliability Implications

		H40	No Action	Change
Average delivered chlorides (mg/l)				
▪ Reservoir needed and failed goal		106	120	-14
▪ Reservoir needed and met goal		65		
▪ Reservoir not needed for blending		38	36	2
Percentage of time water quality goal is met (≤ 65 mg/l chlorides)		94%	62%	32%
Percentage of time blending water is not available from reservoir		10%	100%	-90%
Percentage of April demands met from Los Vaqueros reservoir		85%	0%	85%
Reservoir storage probability:				
Less than or equal to	40 TAF	1%	0%	1%
	44 TAF	7%	0%	7%
	55 TAF	10%	0%	10%
	66 TAF	13%	0%	13%
	75 TAF	17%	0%	17%
	85 TAF	21%	0%	21%
	95 TAF	38%	0%	38%
Average annual diversion for filling (TAF)		15.4	0.0	15.4

Los Vaqueros Project Performance Matrix

Scenario H50

D-1485 with NMFS & USFWS CVP-OCAP biological opinions. Existing level of development.

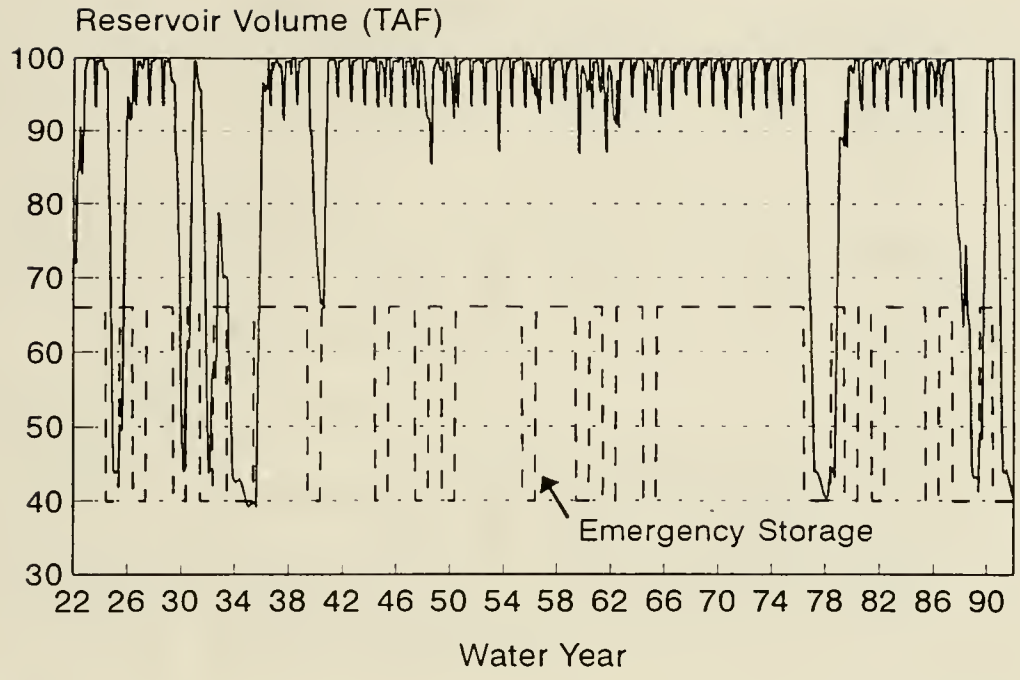
Scenario H50 and its no action base case were based on flows from DWRSIM run 167D (existing level of development, D1485 with NMFS and USFWS biological opinions for CVP-OCAP and 1922-1992 hydrology) and the corresponding FDM 6K salinities. 167D was adapted from DWR's run 167B (D1485+NMFS only). CCWD diversions from scenario H50 were incorporated into DWRSIM run 167E to determine the effect of the Los Vaqueros project on Central Valley operations. Reservoir filling was limited according to operation rules in the NMFS Los Vaqueros Project biological opinion on winter run salmon and the 2 ppt limitations in the USFWS Los Vaqueros Project biological opinion for Delta smelt.

QWEST standards in the NMFS and USFWS CVP-OCAP biological opinions place additional limitations on the availability of CVP rediversion water for filling the Los Vaqueros Reservoir. However, there is a corresponding improvement in water quality at the Rock Slough and Old River intakes.

Water Quality and Reliability Implications

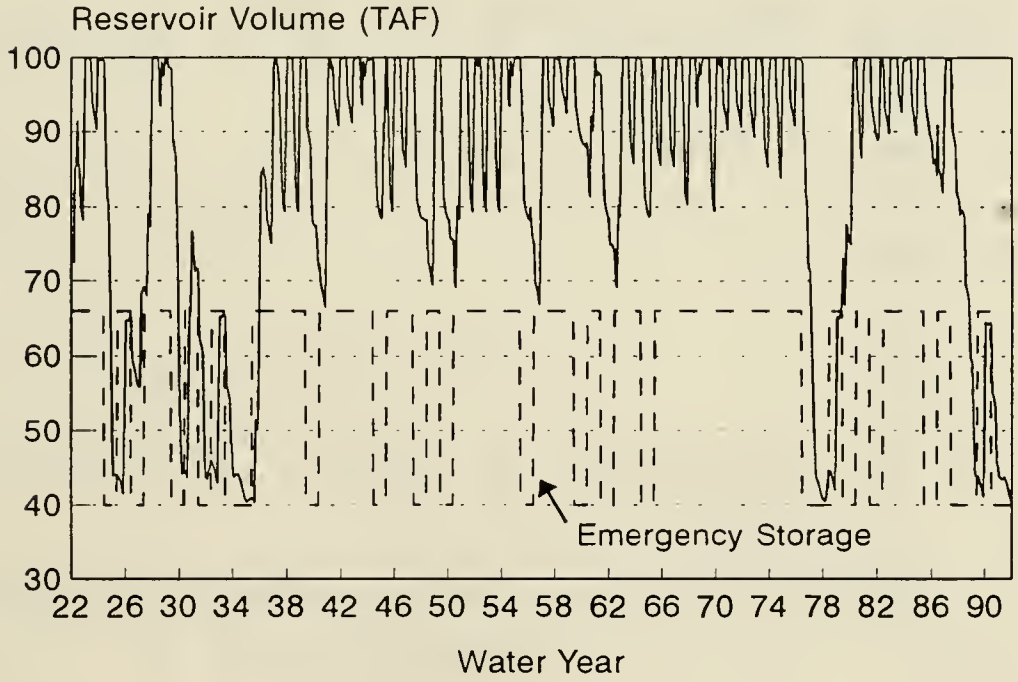
		H50	No Action	Change
Average delivered chlorides (mg/l)				
■ Reservoir needed and failed goal		88	111	-23
■ Reservoir needed and met goal		65		
■ Reservoir not needed for blending		41	41	0
Percentage of time water quality goal is met (≤ 65 mg/l chlorides)		95%	65%	30%
Percentage of time blending water is not available from reservoir		15%	100%	-85%
Percentage of April demands met from Los Vaqueros reservoir		83%	0%	83%
Reservoir storage probability:				
Less than or equal to	40 TAF	0%	0%	0%
	44 TAF	8%	0%	8%
	55 TAF	13%	0%	13%
	66 TAF	18%	0%	19%
	75 TAF	25%	0%	25%
	85 TAF	41%	0%	41%
	95 TAF	65%	0%	65%
Average annual diversion for filling (TAF)		15.6	0.0	15.6

Reservoir Volume
Existing Demands, D1485



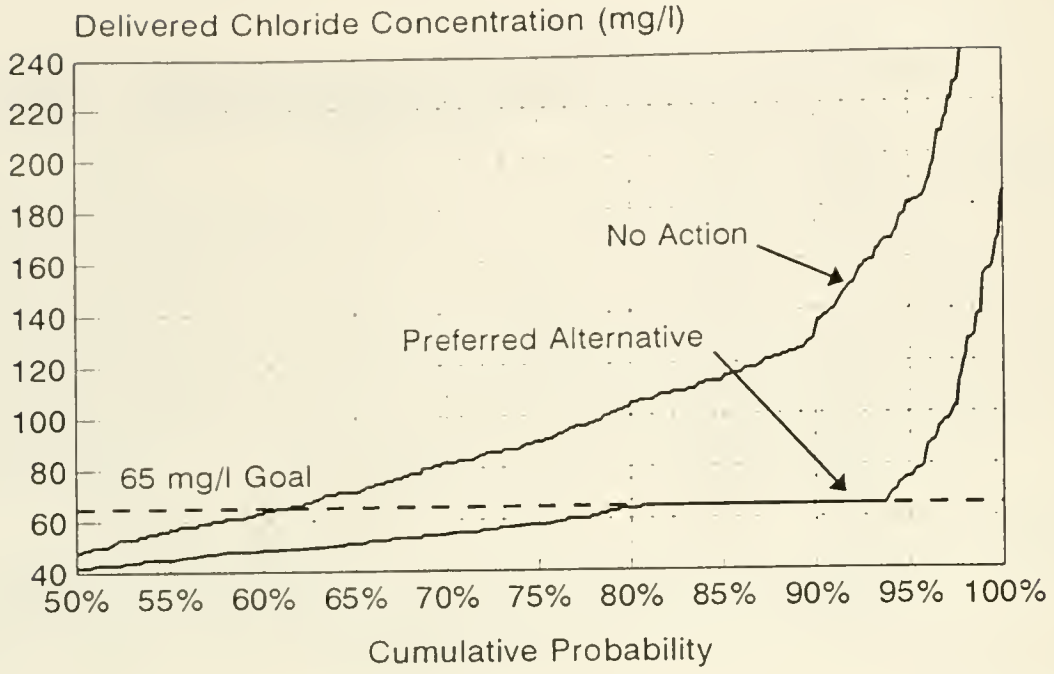
CCWD rad 09/01/93

Reservoir Volume
Existing Demands, D1485+NMFS+USFWS OCAP BO



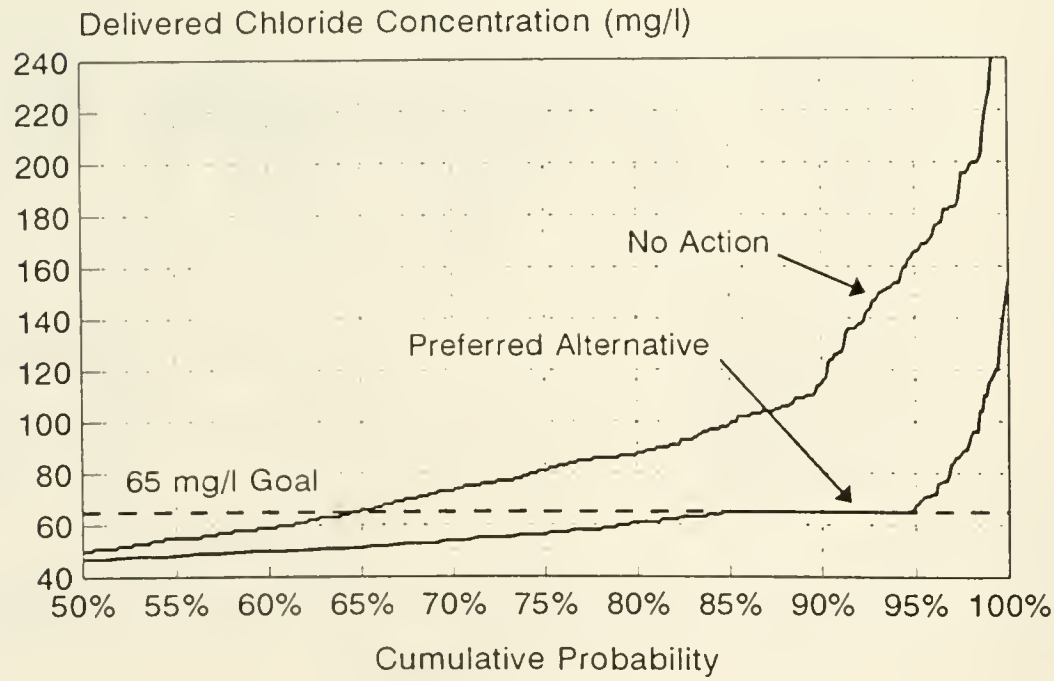
CCWD rad 09/01/93

Delivered Chloride Concentration
Existing Demands, D1485



CCWD rad 09/01/93

Delivered Chloride Concentration
Existing Demands, D1485+NMFS+USFWS OCAP BO



CCWD rad 09/01/93

CCWD Diversions (TAF)
Existing Level of Demand, No-Action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
70 yr avg	10.90	8.91	7.49	6.22	5.06	5.79	5.90	11.17	13.34	15.65	16.36	12.90	119.82
57 yr avg	10.88	8.91	7.46	6.20	5.02	5.64	5.80	11.14	13.39	15.63	16.47	12.88	119.41
Diff:70-57	0.02	0.01	0.03	0.02	0.04	0.15	0.10	0.03	-0.05	0.02	-0.10	0.02	0.41

Difference in CCWD Diversions (TAF)
Existing Level of Demand, Preferred Alternative Minus No-Action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
70 yr avg	3.51	0.22	0.50	-0.12	-0.28	0.09	-4.92	-1.58	0.18	0.18	-0.73	6.51	3.55
57 yr avg	3.71	0.27	0.33	-0.13	-0.28	-0.06	-4.84	-1.95	0.09	0.22	-0.72	6.98	3.60
Diff:70-57	-0.20	-0.05	0.17	0.01	0.00	0.16	-0.08	0.36	0.09	-0.04	-0.01	-0.46	-0.05

Net Delta Outflow (TAF)
Existing Level of Demand, No-Action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
70 yr avg	491	657	1372	2240	2722	2501	1571	1184	815	455	406	380	14795
57 yr avg	461	566	1238	2220	2545	2227	1490	1185	807	440	404	363	13947
Diff:70-57	30	91	134	20	177	274	81	-1	8	15	2	17	848

Difference in Net Delta Outflow (TAF)
Existing Level of Demand, Preferred Alternative Minus No-Action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
70 yr avg	-2	-2	-2	-1	-0	-1	2	0	0	0	-1	-1	-7
57 yr avg	-3	-2	-2	-1	-0	-0	2	0	0	0	-1	-1	-8
Diff:70-57	0	0	0	0	0	-0	-0	-0	0	-0	-0	-0	1

QWEST (CFS)
Existing Level of Demand, No-Action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
70 yr avg	-381	-300	694	3225	5904	4913	3863	5873	3385	193	-1827	-2550
57 yr avg	-660	-707	-98	2487	4426	3155	2854	5466	3112	-57	-1837	-2829
Diff:70-57	279	407	792	738	1477	1758	1009	407	273	250	10	280

Difference in QWEST (CFS)
Existing Level of Demand, Preferred Alternative Minus No-action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
70 yr avg	-42	-4	-12	-0	9	-9	12	4	5	-2	3	-76
57 yr avg	-44	-5	-11	-1	11	-8	11	4	6	-2	6	-79
Diff:70-57	2	1	-1	0	-2	-1	1	-1	-1	0	-3	4

Total Delta Exports (TAF)
Existing Level of Demand, No-Action, D-1485+NMFS+USFWS OCAP BO

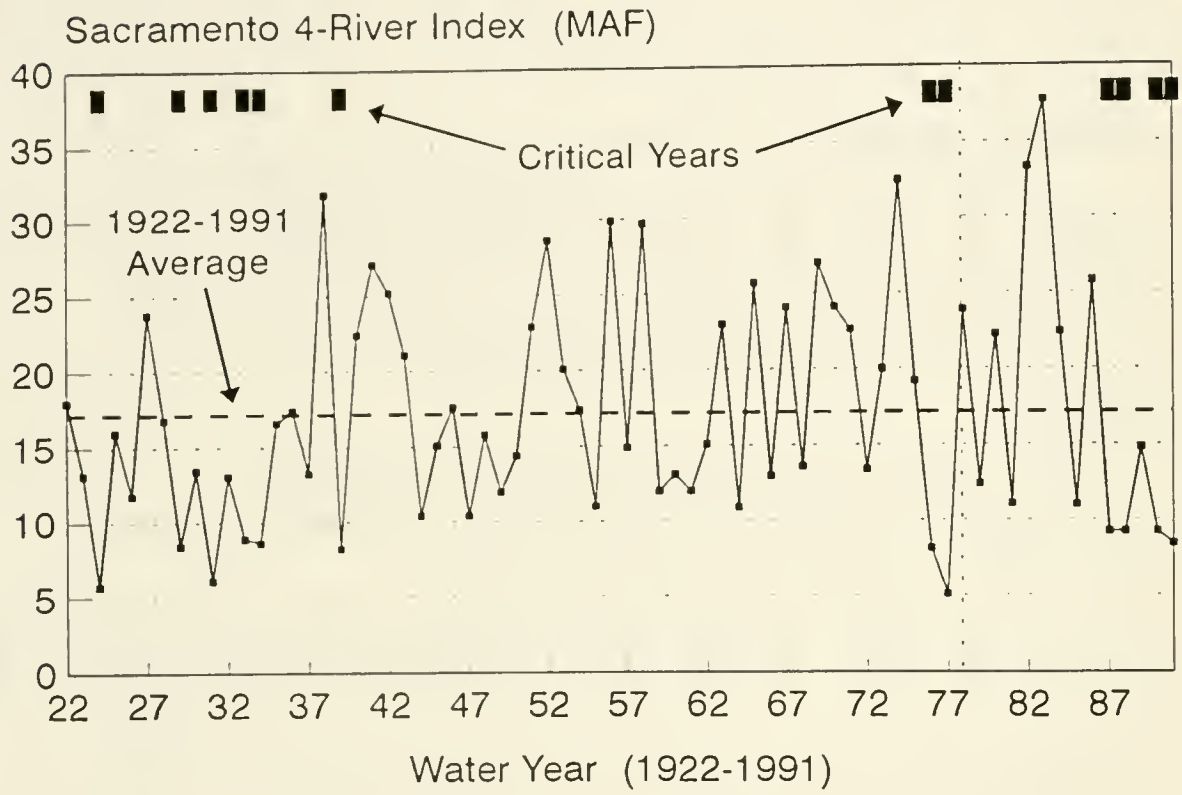
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
70 yr avg	558	545	610	632	505	485	295	220	279	371	531	623	5652
57 yr avg	558	549	616	644	523	480	296	214	276	371	525	626	5677
Diff:70-57	-0	-4	-6	-12	-18	5	-1	6	3	0	6	-3	-25

Difference in Delta Exports (TAF)
Existing Level of Demand, Preferred Alternative Minus No-Action, D-1485+NMFS+USFWS OCAP BO

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
70 yr avg	3	-0	1	-0	-1	1	-1	-0	-0	0	-1	6	8
57 yr avg	3	-0	0	-0	-1	0	-1	-0	-1	0	-1	6	8
Diff:70-57	0	-0	0	0	0	0	-0	0	0	-0	0	-0	0

Sacramento 4-River Index

Source: California Department of Water Resources



CCWD rad 09/01/93

Number of days meeting 2ppt salinity at Chipps Island.
As per proposed EPA standard.
Based on D1485+NMFS+USFWS OCAP BO and preferred alternative
Assumes 2 ppt psu equals 3600 µS/cm

N	Cum Prob %	WYr	Feb-Jun Days	Reqd Days
Wet				
1	4	1927	150	(147)
2	8	1938	150	(147)
3	12	1941	150	(147)
4	16	1942	150	(147)
5	20	1943	150	(147)
6	24	1951	150	(147)
7	28	1953	150	(147)
8	32	1958	150	(147)
9	36	1963	150	(147)
10	40	1965	150	(147)
11	44	1967	150	(147)
12	48	1969	150	(147)
13	52	1970	150	(147)
14	56	1971	150	(147)
15	60	1973	150	(147)
16	64	1974	150	(147)
17	68	1978	150	(147)
18	72	1982	150	(147)
19	76	1983	150	(147)
20	80	1986	150	(147)
21	84	1940	151	(147)
22	88	1952	151	(147)
23	92	1956	151	(147)
24	96	1980	151	(147)
25	100	1984	151	(147)
Above Normal				
1	11	1948	122	(141)*
2	22	1922	150	(141)
3	33	1925	150	(141)
4	44	1935	150	(141)
5	56	1946	150	(141)
6	67	1954	150	(141)
7	78	1975	150	(141)
8	89	1928	151	(141)
9	100	1936	151	(141)

N	Cum Prob %	WYr	Feb-Jun Days	Reqd Days
Below Normal				
1	8	1932	60	(118)*
2	15	1960	90	(118)*
3	23	1989	92	(118)*
4	31	1930	120	(118)
5	39	1966	120	(118)
6	46	1968	121	(118)
7	54	1972	121	(118)
8	62	1923	150	(118)
9	69	1937	150	(118)
10	77	1945	150	(118)
11	85	1950	150	(118)
12	92	1957	150	(118)
13	100	1962	150	(118)
Dry				
1	9	1955	59	(114)*
2	18	1964	60	(114)*
3	27	1947	89	(114)*
4	36	1959	89	(114)*
5	46	1961	89	(114)*
6	55	1981	89	(114)*
7	64	1985	89	(114)*
8	73	1944	90	(114)*
9	82	1949	92	(114)*
10	91	1926	120	(114)
11	100	1979	150	(114)
Critical				
1	8	1931	0	(80)*
2	17	1977	0	(80)*
3	25	1924	29	(80)*
4	33	1988	29	(80)*
5	42	1939	31	(80)*
6	50	1929	59	(80)*
7	58	1933	59	(80)*
8	67	1934	59	(80)*
9	75	1990	59	(80)*
10	83	1991	61	(80)*
11	92	1987	89	(80)
12	100	1976	90	(80)

Attachment 3. Additional Cultural Resources Information

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STATE OF CALIFORNIA — THE RESOURCES AGENCY

PETE WILSON, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

September 9, 1992

REPLY TO: BUR910227A

Susan E. Hoffman, Chief
Division of Planning and Technical Services
Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
SACRAMENTO CA 95825-1898

Project: Request for Determination of Eligibility and Effect for the Los Vaqueros Project, Contra Costa County (Cultural Resources)

Dear Ms. Hoffman:

Thank you for requesting my views on the cited undertaking. Based on staff review of the documentation you submitted, I would like to offer the following comments on the actions you have taken to comply with Section 106 of the National Historic Preservation Act.

Your letter of August 12, 1992, indicates that you have determined the Starr Ranch rivited buildings to be eligible for the National Register of Historic Places (NRHP) under criteria b and c. I concur with your determination that the Starr Ranch rivited buildings are eligible for the NRHP.

The Programmatic Agreement (PA) that has been developed by the Bureau of Reclamation requires a Historic Property Treatment Plan (HPTP) that outlines the treatment for each eligible property within the Area of Potential Effect for the Los Vaqueros project. The implementation of the HPTP will result in a Determination of No Adverse Effect. I concur with your finding of No Adverse Effect with the implementation of the PA.

Sincerely,

Steade R. Craigo, AIA, Acting
State Historic Preservation Officer

cc: Carol Gleichman, ACHP
Dana McGowan, Jones & Stokes Associates, Inc.

STATE OF CALIFORNIA — RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION
P O BOX 942896
SACRAMENTO 94296 0001

PETE WILSON, Governor

July 21, 1992

REPLY TO: BUR910227A2

Susan E. Hoffman, Chief
Division of Planning and Technical Services
Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
SACRAMENTO CA 95825-1898

Project: Request for Determination of Eligibility and Effect for the Los Vaqueros Project, Contra Costa County (Cultural Resources)

Dear Ms. Hoffman:

Thank you for requesting my views on the cited undertaking. Based on staff review of the documentation you submitted, I would like to offer the following comments on the actions you have taken to comply with Section 106 of the National Historic Preservation Act.

The reports indicate that reasonable measures were taken to identify historic properties within the project's APE. While it is seldom possible to guarantee that all cultural resources have been discovered during a survey, your inventory methods are consistent with the Secretary of the Interior's Standards for Identification and satisfy us that you have fulfilled the requirements of 36 CFR 800.4(a and b).

The information presented to justify consideration of the sites as districts within the project area seems well founded. This allows a consistent set of criteria and research questions to be applied to the properties throughout the project area. This consistency allows the research questions to be more focused on the relationship of the sites to each other while maintaining the ability to contrast this to neighboring areas.

I concur with your findings of eligibility as listed in Table 2 of the report titled, "Evaluation, Request for Determination of Eligibility, and Effect for the Los Vaqueros Project, Alemeda and Contra Costa Counties, California". I also concur with the Bureau of Reclamation's finding that the Contra Costa Canal is not eligible for the National Register of Historic Places (NRHP).

You state that you are unsure of the historical significance of the Starr Ranch rivited buildings, which the consultants recommended for

eligibility to the NRHP under criterion d. You may want to consider the uniqueness of the use of this type of construction technology in a rural agricultural setting. The eligibility of the ranch might be considered under criterion c as a 1930s rural complex associated with Oscar Starr.

Other factors that should be considered with the Starr ranch complex is the fact that the ranch was used as a site for developing and testing the agricultural tractor technology that would later become associated with the Caterpiller Tractor Company. The fact that Starr was a founder of the Caterpiller, one of the world's foremost producers of agricultural and earth moving equipment is a key factor in considering the significance. The significance is magnified because of Caterpillar's Bay Area origins. You may wish to consider eligibility of the complex under criteria b.

Please contact us when you have made a determination of eligibility for this property. Until you have resolved your position on the eligibility of this property, I can not consider a determination of effect. I will be looking forward to continuing the consultation on this project.

Sincerely,

Steade R. Craigo, AIA, Acting
State Historic Preservation Officer

PROGRAMMATIC AGREEMENT
AMONG THE BUREAU OF RECLAMATION,
CONTRA COSTA WATER DISTRICT, CALIFORNIA STATE HISTORIC
PRESERVATION OFFICER, AND THE ADVISORY
COUNCIL ON HISTORIC PRESERVATION
REGARDING THE IMPLEMENTATION OF THE LOS VAQUEROS PROJECT

WHEREAS, the Bureau of Reclamation (BOR) has determined that implementation of the Los Vaqueros Project (Project) may affect historic properties included in or eligible for inclusion in the National Register of Historic Places, and has consulted with the California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to Section 800.13 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (16 USC 470f); and

WHEREAS, The Los Vaqueros Project involves the construction of a reservoir, water conveyance system, recreation facilities, and the rerouting of roads and utilities. The project is to be constructed on non-Federal land and does not involve any Federal funds but requires Federal permits and contracts. The Project may affect historic properties through the construction of project components and the operation of facilities; and

WHEREAS, The area of potential effects (APE) for this undertaking includes lands subject to effects from project construction and operation of facilities. This APE is delineated in Attachments 1-4 and may be modified according to the terms specified in Stipulation 1; and

WHEREAS, the Contra Costa Water District (CCWD) was consulted and has been invited to concur in this Programmatic Agreement (PA); and

WHEREAS, the Corps of Engineers (COE) is a cooperating Federal Agency and has been invited to concur in this PA; and

WHEREAS, the California State Water Resources Control Board (SWRCB) is a responsible agency for purposes of compliance with California Environmental Quality Act; and

WHEREAS, the scope and magnitude of effects to historic properties have not yet been determined because project evaluation studies remain to be completed within the APE; and

WHEREAS, the definitions listed in 36 CFR Part 800.2 are applicable throughout this PA;

NOW, THEREFORE, the BOR, COE, California SHPO, SWRCB, Council and CCWD agree that the Los Vaqueros Project shall be administered in

accordance with the following stipulations to satisfy BOR's Section 106 responsibility for all individual aspects of the project.

STIPULATIONS

BOR will ensure that the following measures will be carried out:

1. DEFINITION OF THE PROJECT AND ASSIGNMENT OF RESPONSIBILITY

The project is defined in CCWD and BOR's joint Los Vaqueros Project Stage 2 EIR/EIS as the Los Vaqueros reservoir alternative (1992). The BOR is designated lead federal agency (DL) for the implementation of this agreement, with the COE, CCWD, and SWRCB as responsible/cooperating parties.

A. If the nature of the Project changes, the BOR will consult with the SHPO, CCWD, SWRCB, and the COE in a timely manner to determine the need for modification of the APE and scope of historic property identification, evaluation, and treatment measures defined in Stipulations 2-4 below. The Council will be notified of any agreed upon changes before those changes cause any effect to historic properties, and any objections raised by Council will be considered in further consultation. If agreement cannot be reached about the scope of these modifications, the BOR shall consult the Council pursuant to Stipulation 12.

B. In the event that a change in the DL is proposed, the BOR will immediately notify the other parties to this agreement and an amendment to the PA will be initiated through the process indentified in Stipulation 11.

2. INVENTORY OF HISTORIC PROPERTIES

The BOR will consult with the SHPO to review historic property identification studies already conducted in the Project's APE and determine the scope and extent of further actions needed to complete the inventory. The BOR shall then ensure that the necessary actions are taken to complete the historic property inventory of the APE in a manner consistent with the Secretary of the Interior Standards and Guidelines for Identification (48 FR 44720-23), the National Park Service publication The Archaeological Survey: Methods and Uses (1978: GPO Stock No. 024-016-00091), and guidance offered by the SHPO.

The BOR will ensure that archaeological properties identified during the inventory are recorded or updated on California Department of Parks and Recreation Form 422 in accordance with the Office of Historic Preservation's (OHP) guidelines California Archaeological Handbook for Completing an Archaeological Site Record (March 1989) and that those forms have been submitted and

permanent site numbers have been assigned by the appropriate Information Center of the California Archaeological Inventory prior to the submission of inventory reports for review. Historic resources located during the inventory shall be recorded on DPR Form 523 in accordance with the OHP's Instructions for Completing California Historic Resources Inventory Forms (March 1984).

The BOR shall ensure that reports are prepared and circulated for review in accordance with the provisions contained in Stipulation 6 prior to taking any action that might affect historic properties.

3. HISTORIC PROPERTY EVALUATION

The BOR will consult with the SHPO and the cooperating agencies to determine the scope and timing of the studies needed for purposes of evaluating the National Register of Historic Places (NRHP) eligibility of cultural resources in the APE prior to initiating any activities that might affect historic properties.

The BOR will ensure that all cultural resources affected by the Project are evaluated to determine their eligibility for inclusion in the NRHP in consultation with the SHPO and the responsible/cooperating agencies, taking into account the Secretary of Interior's Standards and Guidelines for Evaluation (48 FR 190:44729-44738), National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (1991), Guidelines for Archaeological Research Designs (Office of Historic Preservation 1991), and other guidance offered by the SHPO. All evaluations will be directed by a research design.

Once evaluation studies have been initiated, the BOR will ensure that data recovered are fully analyzed and documented according to the research design that was prepared to guide the evaluation. Changes in the Project will not relieve the BOR from the responsibility to ensure completion of resource evaluations once data have been collected or cultural materials have been removed from an archaeological site.

By mutual agreement among the BOR, COE, SWRCB, and the SHPO, evaluation studies will be completed and be addressed in a Determination of Eligibility report. The BOR shall ensure that the evaluation study or studies are prepared and submitted for review according to the provisions of Stipulation 6. No further consideration need be given properties the BOR, SHPO, and the responsible/cooperating agencies agree are not eligible for inclusion in the NRHP. If an evaluation results in the identification of a property or properties that the BOR, SHPO, or responsible/cooperating agencies agree are eligible for inclusion in the NRHP, the BOR shall ensure that they are treated in accordance with Stipulation 4 and a Determination of Effect shall be prepared and submitted to the SHPO.

4. HISTORIC PROPERTY TREATMENT PLAN(S) (HPTP)

The BOR will consult with the SHPO, Council, CCWD, and the responsible/cooperating agencies to develop mutually acceptable HPTP or HPTPs for all NRHP eligible properties in the Project's APE. Separate HPTPs may be prepared for individual components of the Project if agreed in advance by the BOR, SHPO, COE, SWRCB, and CCWD. Each HPTP will be submitted for review according to the procedures defined in Stipulation 6. Following its acceptance by the reviewing parties, or completion of the dispute resolution procedures in Stipulation 12, the BOR will ensure that the HPTP(s) is implemented.

Each HPTP will take into account the principles, standards, and guidance in Archaeology and Historic Preservation; Secretary of Interior's Standards and Guidelines (48 FR 44716-44742), the Council's publication Treatment of Archaeological Properties (1980), and guidance offered by SHPO. Each HPTP will address, at a minimum, the following issues:

A. The actions that will be taken to protect and conserve historic properties. These protective measures may include, but should not necessarily be limited to monitoring; capping; fencing; land use policy and planning techniques such as zoning restrictions, conservation easements, protective covenants, general plan revisions, and transfer of development rights; and other appropriate measures.

B. The need for data recovery at sites subject to adverse affects. Where data recovery is required at a NRHP eligible or listed archaeological site or sites, the HPTP shall refer to the research design in the Evaluation, Request for Determination of Eligibility and Effect for the Los Vaqueros Project, Alameda and Contra Costa Counties, California to guide that work. The HPTP shall specify the types and amounts of analysis that will be conducted, how reports will be prepared and distributed, where recovered materials will be curated, how interested parties will be invited to participate, what efforts will be taken to interpret the results of the investigation(s) to the public, and a schedule for accomplishing the study or studies.

C. Any eligible property, properties, or portions of those properties that will be destroyed or altered, without data recovery or other treatment;

D. A schedule for implementation of all treatment measures defined in the HPTP.

5. PROTECTION OF SITES PRIOR TO TREATMENT

The BOR shall ensure that historic properties scheduled for treatment in accordance with Stipulations 2 - 4 are protected

against damage until applicable treatment measures are implemented.

6. REPORT FORMAT AND REVIEW

The BOR shall ensure that all documents prepared to satisfy the terms of this agreement are responsive to contemporary professional standards, the Secretary of Interior's Format Standards for Final Reports of Data Recovery Programs (42 FR 5377-79), and the OHP's Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (1989). Archaeological sites shall be referred to by their permanent trinomial designation in all reports. Precise historic property locational information shall not be placed in documents for public distribution if the release of those data may adversely affect the properties.

A. Unless otherwise agreed to by the BOR, COE, SWRCB, CCWD, Council, and SHPO, each document prepared to satisfy the stipulations of this agreement, will be submitted by the BOR to the responsible/cooperating agencies, Council, and SHPO for a 30 day review period commencing on the day of receipt by the reviewing party. If the reviewing parties have no objection to the findings of the document, or they fail to comment in the allotted time, the BOR may assume acceptance of the document and implement the subsequent actions required for compliance with this agreement, or if no further actions are required, the BOR may authorize construction of the Project or Project component covered by that document.

B. If objections are raised in the review period, the BOR shall consult with the objecting party to alleviate these concerns. If objections cannot be resolved to the satisfaction of all reviewing parties, the BOR shall consult the Council pursuant to Stipulation 12. The BOR will then ensure that the revised document is implemented in a manner that takes into account the Council's comments.

C. Copies of each accepted final report will be submitted by the BOR to the Council, SHPO, CCWD, COE, SWRCB, and the appropriate Information Center of the California Archaeological Inventory.

7. PARTICIPATION OF INTERESTED PARTIES

The BOR shall provide the other parties to this agreement a plan defining how interested members of the public will be given opportunities to comment on implementation of this agreement. The plan will include provisions for involving the Most Likely Descendants of Native American groups associated with the Project, as identified through consultation with the California

Native American Heritage Commission. To every reasonable and feasible extent, the views of the Descendants will be considered and integrated into planning and conducting any work involving the disturbance or scientific excavation of historic properties associated with Native Americans.

8. CURATION OF RECOVERED DATA

The BOR shall assist CCWD in assuring that all materials and records resulting from the implementation of this agreement are curated or otherwise treated in accordance with the Secretary of Interior's Standards and Guidelines, 36 CFR Part 79. A curatorial agreement or other provisions for the disposition of recovered data shall be reached between CCWD, a specific curatorial facility, and other interested parties prior to the implementation of any subsurface archaeological studies that may be required under the terms of this agreement.

9. PROFESSIONAL REQUIREMENTS

All studies conducted under the terms of this agreement will be carried out or directly supervised by appropriately trained persons who meet the Secretary of Interior's Professional Qualifications Standards for the particular field of study required in that investigation. The BOR and COE will ensure they retain staff meeting the aforementioned standards for the purposes of monitoring and implementing the terms of this agreement.

10. ANNUAL REPORT

A brief annual report will be prepared by the BOR and presented to the cooperating agencies and the SHPO at the annual meeting described below. The Council will be provided a copy of the annual report and may attend the annual meeting.

11. REVIEW OF IMPLEMENTATION AND AMENDMENT OF AGREEMENT

All parties to this agreement shall confer annually on the anniversary of its signing unless it is mutually agreed that no meeting is necessary. This annual meeting will be held for the purpose of reviewing implementation of the terms of this agreement and to determine whether revisions of the agreement are needed. If revisions are needed, the parties to this agreement shall consult in accordance with 36 CFR 800.13 to make such revisions.

Any party to this agreement may also request that it be amended by notifying the other parties, whereupon all of the other parties will consult in accordance with 36 CFR 800.13 to consider such revisions. This request may be initiated any time during

the implementation of this agreement.

12. DISPUTES

Should any of the parties to this agreement object within 30 days to any documents provided for review pursuant to its terms, the BOR shall consult with the objecting party(ies) to resolve their concern. If the BOR determines that the objection cannot be resolved, it shall submit documentation relevant to the dispute to the Council with a request for comments pursuant to this stipulation. Any Council comment provided within 30 days of such a request will be taken into account by the BOR in accordance with 36 CFR 800.6(c)(2) with reference only to the subject of the dispute. The BOR responsibility to carry out actions unrelated to the dispute will remain unchanged.

13. FAILURE TO CARRY OUT THE TERMS OF THIS AGREEMENT

If the BOR fails to carry out the terms of this agreement, it must comply with 36 CFR 800.4 through 800.6 for the Project or any aspect of the Project that could affect historic properties before taking or sanctioning any action.

14. TERMINATION

Any party to this agreement may terminate it by providing thirty (30) days written notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the BOR shall comply with 36 CFR 800.4 through 800.6 with regard to individual undertakings covered or any aspect of the Project covered by this Programmatic Agreement.

CONCLUSION

Execution and implementation of this agreement evidences that the BOR and the COE have afforded the Council a reasonable opportunity to comment on the management of historic properties affected by the Los Vaqueros Project and that the BOR and COE have taken into account the effects of the Project on such properties in compliance with Section 106 of National Historic Preservation Act and its implementing regulations (36 CFR 800).

Except as expressly set forth herein, COE, SHPO, BOR, SWRCB, Council, and CCWD shall not be required to perform any act or bear any responsibility pursuant to this agreement; nothing in this agreement shall be construed to enable a party to avoid its obligations under the National Historic Preservation Act or its implementing regulations.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: Robert D. Bush DATE: 2/3/93

TITLE: Executive Director

BUREAU OF RECLAMATION

BY: Dan M. Fulton DATE: 12/23/92

ACTING FOR

TITLE: Regional Director

ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT

BY: Laura R. Jackson DATE: 4 Dec 92

TITLE: District Engineer

CALIFORNIA HISTORIC PRESERVATION OFFICER

BY: Steade R. Craigo DATE: 12-31-92

CONTRA COSTA WATER DISTRICT

BY: John K. Gregg DATE: 1/8/93

TITLE: Program Manager, Los Vaqueros Project

STATE WATER RESOURCES CONTROL BOARD

BY: Walt Pettit DATE: 12/10/92

TITLE: Executive Director

CULTURAL RESOURCES BACKGROUND INFORMATION

Historic Context

The following prehistoric, ethnographic, and historical information is supplemental to the draft environmental impact report/environmental impact statement (EIR/EIS) and provides historic context statement required by the U.S. Secretary of the Interior's guidelines to evaluate cultural resources.

Regional Prehistory

Because of its juxtaposition between the Bay Area and the Central Valley/ Sacramento-San Joaquin Delta, discussions of prehistoric research for the Los Vaqueros locality must include information from both regions. Because both areas have been the focus of considerable archeological investigation and extensive information is available for both, the following outlines only those developments that figure prominently in research issues discussed below.

Early archeological investigations in central California focused on establishing chronological sequences using temporally sensitive artifacts found in burial association. In 1939, three basic periods were identified: the Early Period (2500-1500 B.C.), the Middle Period (1500 B.C.-500 A.D.), and the Late Period (500-1800 A.D.) (Lillard and Purves 1936, Lillard et al. 1939, Moratto 1984).

In the late 1940s, Beardsley focused on the question of the applicability of the central California sequence to the Bay Area. His refinement of the system resulted in the Early, Middle, and Late periods being renamed "horizons", which were then subdivided using terms such as "zone", "province", "facies", and "component" based on the intersite and intrasite similarities or dissimilarities of the archeological manifestations (Beardsley 1954). The result of this work was the development of the Central California Taxonomic System (CCTS).

Although Beardsley's approach built additional flexibility into the system, his ad hoc expansion of the program into other areas was seen as problematic, especially in light of data suggesting that the Early, Middle, and Late Horizons did not occur contemporaneously in central California. Gerow (1968) substantiated this by presenting evidence that "Early" and "Middle" expressions had existed simultaneously for a substantial amount of time in the

Bay Area. As a result of this observation, the CCTS was reduced to a general, temporary framework.

Ragir (1972) dealt with the drawbacks of the CCTS in her reevaluation of the Early Horizon by renaming the time-oriented Early, Middle, and Late Horizons Windmiller, Cosumnes, and Hotchkiss, respectively, after the localities where the distinct cultural manifestations were best represented. In doing so, she gave more significance to the location of the site and the cultural materials observed than to the period they (presumably) represented.

Along the same lines, Bennyhoff divided central California into local districts (i.e., Cosumnes, Colusa, and Diablo), which put further emphasis on geographic location rather than period (Elssaser 1978). Fredrickson, in collaboration with Bennyhoff, continued this trend by replacing horizon with the term "pattern", described as "an adaptive mode extending across one or more regions, characterized by particular technological skills and devices, and particular economic modes" (Fredrickson 1973).

Fredrickson's synthesis of culture histories from the Delta, Bay Area, and north Coast Ranges, based largely on his observations of adaptive behavior, was an outgrowth of this concept (Fredrickson 1973, 1974a). While some researchers have applauded Fredrickson's attempt to integrate cultural sequences in California, others (Gerow 1974, King 1974) have questioned Fredrickson's interpretations of the data used to support his regional chronology. King (1974) has argued that Fredrickson's use of evolutionary terms, such as "Paleo-Indian Period"; "Lower, Middle, and Upper Archaic Periods"; and "Upper and Lower Emergent Periods", to create a temporally integrative scheme makes the distinction between simple temporal sequences based on key cultural traits and explication of the processes underlying socio-cultural change unclear. Regionwide application of such a heuristic device awaits further research.

When viewed as a hypothesis, Fredrickson's model for the Los Vaqueros Project offers many avenues through which to address important research issues in central California. The Los Vaqueros Project area, because of its intermediate location between regions with established cultural sequences, may provide data that address the applicability of a regional chronology.

Previous Archeological Investigations in the Region

An archival review of the files of the Northwest Information Center (NWIC) at Sonoma State University (SSU) was performed for 23 U.S. Geological Survey quadrangles in the project vicinity. Before the current study, the Los Vaqueros area was subjected to extensive archeological reconnaissance; however, only two sites, CA-CCo-310 and -417, have been excavated within the project area and the results of both studies have not been published. Virtually no archeological excavation has been performed in the project vicinity, and the work that has been conducted has gone unreported.

In the region, however, many archeological sites have been excavated. Excavation projects were dispersed and primarily of small scale. Reports were located for excavations at 17 archeological sites within this area; several other sites (CA-CCo-31, -138, -312, and -313) are known to have been excavated, but the reports were not available. Concentrated investigations of watersheds or other geographic units have not been performed.

Fredrickson's work at CA-CCo-30, -308 and -309 (Fredrickson 1965, 1966), augmented by work by Moss and Mead at CA-CCo-311 (1967) and Pastron at CA-CCo-30 (1979) represents the most concentrated subsurface investigation in the project region. CA-CCo-30, -308, and -309 all lie within the San Ramon Creek watershed, in the Alamo vicinity. In 1965, Fredrickson interpreted the sites as representative of five temporal components with reference to the CCTS (Heizer 1949), which was the predominant chronological and topological scheme at that time. In this interpretation, the sites represented a continuum from early Middle Horizon in the lower stratum of CA-CCo-308 (radiocarbon dated to 4,450 ± 400 years B.P.) to Phase II Late Horizon at CA-CCo-309 (a single-component site radiocarbon dated 285 ± 95 years B.P.). Chronologically, CA-CCo-30, a two-component site, was placed between CA-CCo-308 and -309, with a Middle Horizon component and a Phase I Late Horizon component. Pastron's (1979) excavation at CA-CCo-30 confirmed these two components. CA-CCo-308 also contained a mid-Middle Horizon component and a component identified as representing a transition phase between the Late-Middle and Phase I Late Horizon. This transition phase, estimated to date from 0 A.D. to 300 A.D., was also identified at CA-CCo-20 and -250 in the Diablo locality and at CA-Ala-290 and -309 in the San Francisco Bay region (reports not located).

A report on the small salvage excavation at CA-CCo-311 (Moss and Mead 1967) was inconclusive about chronology and affiliation; however, since the report was published, the site has been identified as representing a Meganos intrusion dating to before the Middle Horizon/Late Transition Phase (Fredrickson pers. comm.). The site contained both flexed and extended burials. *Olivella* beads of unspecified types; round and rectangular *Haliotis* ornaments; and chert, quartz, and obsidian projectile points, including 13 chert specimens described as "ceremonial" were reported in association with burials. CA-CCo-31 in Pleasant Hill, which contained extended burials, was assigned by Bennyhoff to the Meganos Aspect and was considered contemporaneous with CA-CCo-311 based on bead co-occurrences (Fredrickson pers. comm.).

In the Diablo quadrangle, west of Los Vaqueros, CA-CCo-352 was sampled by Fredrickson in 1975. CA-CCo-352 was interpreted as a habitation, activity, and cemetery site. Residents are believed to have maintained exchange relationships to import obsidian from Napa and shellfish from the bayshore. Fredrickson assigned the site to Phase I of the Late Horizon (circa 700 A.D. to 1100 A.D.), with continuing occupation into Phase II of the Late Horizon.

In Fredrickson's 1965 interpretation, the culture of the Diablo locality during the Middle Horizon was dominated by inland adaptations and Central Valley/Delta patterns. The Transition Phase, during which there was a significant increase in the use of marine mollusks (by a factor of 15-20 times) compared to both preceding and subsequent periods, represents an immigration to interior Contra Costa County of a people adapted to a

bayshore economy. The following Phase I Late Horizon shows a group fully adapted to the inland environment. Also noted during the Transition Phase was an increase in imported obsidian (this trend continued and accelerated in the Phase I Late Horizon as seen at CA-CCo-30), a paucity of local lithic materials other than chert, and greater use of imported foods. Fredrickson interpreted these changes as representing population movement, rather than diffusion.

The three sites represent intermittent occupation over 4,000 years. The earliest group shared traits of the Early and Middle Horizon. A tentative mid-Middle Horizon component was also delineated. Cultural affiliation during the Middle Horizon is believed to be with the Sacramento Valley with some influence from the Napa Valley. This may have been followed by a time (not manifest at CA-CCo-30, -308, -309) when influences of the northern San Joaquin Valley were manifest in the Diablo locality. Beginning with the Transition Phase, cultural influences of the Bay region are interpreted to represent an influx of a bayshore-oriented population. Phases I and II of the Late Horizon artifact assemblages in interior Contra Costa County give the impression of affiliations with the Late Horizon in the lower Sacramento Valley, along with certain characteristic Delta elements. However, interior Contra Costa County groups may not have participated in the ceremonial life of populations of the Sacramento Valley or may have participated in such ceremonies in attenuated form.

Fredrickson had refined his interpretation of CA-CCo-308 chronology by 1977, and had assessed the deepest component of the site as representing the Berkeley Pattern, which was seen as contemporaneous with the Windmiller Pattern of the Sacramento Valley (Fredrickson 1977a). He also noted that the lowest component of CA-CCo-308 had cultural material under as much as 22 feet of sterile alluvium. Radiocarbon dates of 4,450 ± 400 B.P., 3,125 ± 230 B.P., and 2,870 ± 335 B.P. were reported for the lowest component of CA-CCo-308. A date of 3,000 ± 200 B.P. may be most accurate (Banks et al. 1984). Later radiocarbon assessment of samples from the middle component of CA-CCo-308 yielded additional dates of 1,250 ± 230 B.P. and 2,860 ± 120 B.P., while the uppermost component yielded dates of 470 ± 120, 865 ± 50, 940 ± 50, 980 ± 50, and 1185 ± 125 B.P. Additional assessments for CA-CCo-30 (upper component) ranged from 265 to 585 ± 50 B.P. CA-CCo-309 yielded a date of 285 ± 50 B.P. (Fredrickson 1980.)

Northwestward, in the Walnut Creek area, Banks and colleagues excavated at CA-CCo-431 in 1979 (Banks et al. 1984). The site, a buried deposit, appeared to be a sparse cultural deposit, possibly at the margin of a more intensively occupied site. Obsidian hydration suggested occupation dating to 1,200-2,300 years ago. Three buried surfaces were noted; the middle of these was radiocarbon dated as younger than 2,870 ± 120 B.P. The cultural affiliation of the site would be the Alamo Phase of the early Berkeley Pattern of the Concord Phase of the Windmiller/Berkeley Transition. Trade interactions with Napa Glass Mountain area are indicated; whether other sources were used is unknown. Trade for chert from a Monterey source is also suggested.

CA-CCo-236, in Lafayette, was excavated by Baker in 1987. Virtually all time-sensitive artifacts from this site, including clam shell and *Olivella* lipped beads and small (Type 1) projectile points, indicate that this site was occupied principally during the latter

part of the Augustine Pattern (Phase II of the Late Horizon), dating from about 1500 A.D. to the late 1700s. Heavy use of imported obsidian as raw material, near-complete exclusion of chert, and the predominance of clam shells over mussel shells also indicate late use of the site. Mortars, pestles, and small arrow points suggestive of bow and arrow use were also recovered. Raptor remains could suggest participation in the Kuksu Cult. Evidence of extensive trade networks is noted. Banks et al. (1984) present chronological correlations for the Diablo District based on the excavations summarized here and elsewhere.

Somewhat closer to the project area is CA-Ala-413, the Santa Rita Village site, near Pleasanton. Sixty-four burials excavated from the site in 1978 were analyzed by Wiberg (1984a) as manifestations of a Meganos intrusion. Wiberg did not describe artifacts in detail or prepare an artifact typology. The Meganos Aspect, first identified in the northern San Joaquin Valley, was described by Bennyhoff (1968) as a merging of Windmiller Pattern and Berkeley Pattern elements. A brief expansion of this culture into the Diablo and Alameda Districts between the end of the Middle Horizon and the Middle Horizon/Late Augustine Horizon transition is suggested by Bennyhoff (Wiberg 1984a). This would correlate with the cultural component described for CA-CCo-31 and -311, above. Wiberg writes that two alternative dating schemes for the central California archeological sequence date this Meganos intrusion at 300 B.C.-100 A.D., or 500-700 A.D. (Fredrickson 1980). Wiberg argues that the Meganos culture was more widespread and longer lasting in some localities than previously thought.

Wiberg distinguished two components at CA-Ala-413. The lower component, radiocarbon dated between 400 B.C. and 200 A.D., is characterized by flexed burials with few artifacts. Some extended burials occur at the same level as the extended burials or below the flexed burials. Wiberg identifies the upper component of the site as a possible Meganos intrusion. Radiocarbon dates indicate that the upper component pattern commenced after 100 A.D. and lasted until 500 A.D. or later. It is defined by exclusively extended burials, northerly burial orientation, and abundant grave associations, including thousands of shell beads and other shell artifacts, quartz crystals, charmstones, and other nonutilitarian grave goods.

Bennyhoff defined the Meganos Aspect on the basis of mixed flexed and extended burials, the latter predominating and interpreted as a Windmiller trait, along with a low yield of associated artifacts, a Berkeley Pattern characteristic. Other traits of Bennyhoff's Meganos Aspect are an underdeveloped ceremonial system and a relatively undeveloped exchange network. In contrast, at CA-Ala-13, the extended upper component burials had rich, frequently ceremonial associations, more like classic Windmiller sites. Exchange networks and ceremonial systems appear well developed. Wiberg suggests that the Meganos Aspect, as seen in the upper component at CA-Ala-413, represents a survival of the Windmiller culture. He speculates that the Windmiller traits surviving from the lower Sacramento Valley could be maintained at CA-Ala-413 because of the residents' political position, gained through local exchange networks.

Clearly, much more extensive investigation will be required to clearly define chronology and cultural patterns in this area. The cultural affiliations defined by Wiberg must await confirmation by analysis of the full CA-Ala-413 assemblage. Little has been

reported regarding the artifacts themselves, although Wiberg's illustrations include rectangular and round *Haliotis* ornaments and very large (12- to 17-cm long) obsidian and chert blades.

Ca-CCo-222, located northwest of the project area in Clayton Valley, was excavated by Holman and Associates in 1982. Holman suggested the possibility of a Berkeley Pattern component for the lower part of the site, with an upper more extensive and better represented Augustine Pattern component. These San Francisco Bay region patterns roughly equate with Early and Late Horizons of the Sacramento Valley or with Fredrickson's (1974a) Middle Archaic and Emergent Periods. Supportive of the Augustine Pattern are a clam shell disk bead, obsidian projectile point fragments of late types, a sandstone discoidal similar to late Alameda District and Diablo District specimens, shaped mortar fragments, and shaped pestles. The primarily Napa Glass Mountain obsidian sources tend to conform to the patterns established at other late interior sites. Shell is relatively rare; only two shell artifacts were recovered. There is no direct evidence the Meganos Aspect in the portion of the site excavated. However, a Berkeley Pattern Middle Horizon affiliation for the lowest level of the site is suggested by a radiocarbon date of 2,820 ± 120 B.P., and a single basalt point fragment and a expanding stem point made of chert. This sample came from a flexed burial that had an associated large leaf-shaped obsidian biface from a Napa Glass Mountain source. The upper component yielded a radiocarbon date of 1,600 ± 200 B.P., too early to represent Phase II of the Augustine Pattern evident in other areas of the site. Horizontal stratification may occur at the site, and although the cultural chronology of this site is not clear, at least some portion of the site probably represents the Phase II Late Horizon (Augustine Pattern).

Another site or site complex in the Clayton vicinity, CA-Ala-312/313, was excavated by California State University, Hayward in 1969 (no report is available). At least 1,000 artifacts and 15 burials were recovered. Artifacts indicate that "occupation began during the initial stages of Phase I Late Horizon (c. 700 A.D. to 1000 A.D.) and terminated after the introduction of desert side-notched points, Ca. 1450 A.D." (Baker 1991). No other information is available at NWIC regarding this assemblage.

Near Antioch, two sites, CA-CCo-385 and -386, were excavated by King in 1979. King postulates settlement at CA-CCo-386 before 1000 A.D., based on the absence of late-period artifacts and the presence of many fragments and obsidian flakes "retouched from large knives" (King 1979). Features included hearths and pits. Few additional data were presented. CA-CCo-386 was viewed as a habitation site; CA-CCo-385 was viewed as an activity area.

Eastward into the Delta, two burials were salvaged in 1977 from CA-CCo-368 on the Hotchkiss tract. One was extended on its side, the other flexed ventrally. A bowl mortar was associated with one burial. The site, a midden deposit on a Delta sandhill, was assumed to be of the ethnographic period, based on the presence of dark midden rather than the typical "burial island" sand mound of earlier types in the Delta (Miller et al. 1977).

South of the project vicinity, near Altamont, McGeein and McGeein excavated at CA-Ala-28 in 1957. Nine house pits in a dark gray midden were recorded. Only 53 artifacts

were recovered from over 50 cubic yards of excavated material. The assemblage included hopper mortars; bone awls; bird bone tubes; scapula saws; *Haliotis* ornament fragments; *Olivella* beads; large obsidian and chert projectile points; and chert, chalcedony, and quartz blades. Two burials were uncovered: one the remains of a tightly flexed infant, the other fragments of an adult. On the basis of the faunal assemblage, which included a variety of fish and animal bone, the site was postulated to have been occupied during late fall, winter, and early spring and was believed to date to the precontact Late Horizon.

West of this site, within the Livermore quadrangle, Parkman excavated at CA-Ala-394 in 1974. A letter regarding field notes from the site reports that the site, deeply buried by alluvium, "was low yield in nature" (Parkman 1977). Five extended and one flexed burial were reportedly excavated from the site vicinity by local residents. Numerous scrapers and other chert and obsidian tools, a bone awl, and a bird bone tube were recovered. Parkman postulated that the site was an early Middle Horizon or late Early Horizon deposit. Fredrickson (1977b) examined the notes and came to a similar conclusion, although he noted that more current terminology would equate Early Horizon with the Windmiller Pattern, Middle Horizon with the Berkeley Pattern, and Late Horizon with the Augustine Pattern and that he would assess the site as belonging to the Berkeley Pattern.

South of the Pleasanton site, Leventhal et al. excavated at CA-Ala-428/H in the Sunol Regional Wilderness. Leventhal assigns the site to the Middle Period in dating scheme B1 of Bennyhoff and Hughes (1987) and believes that the site predates 900 A.D. This chronological assignment is based on large projectile points classified as dart points (rather than arrow points). Mortars and pestles from the site are unshaped, and two manos (but no metates) were noted. One clam shell disc bead, a Late Horizon Phase I or Augustine time marker, was collected from the surface. Six of seven obsidian pieces collected were identified to be from Napa; a seventh specimen may have come from east of the Sierra. Radiocarbon dates did not confirm this assignment: four dates, all on samples that were somewhat suspect, included modern, 1507 A.D., 1409 A.D., and 982 A.D., obsidian hydration-derived dates that were not consistent with radiocarbon dates.

Data from these sites are presented to contribute to hypothesis formulation for the Los Vaqueros area. Correlation of these regional chronological signatures with the Los Vaqueros area is one of the main research topics guiding future archeological work.

Ethnographic Setting

The following summarizes the history of Native American involvement in the Los Vaqueros region and addresses contemporary Native American concerns and interests concerning the reservoir project. The methods used to gather data for this section include oral histories, ethnohistory, cultural geography, folklore studies, ethnoastronomy, comparative ethnography, mission record research, linguistics, and archeology.

Preliminary interviews were conducted with the Native Americans most likely descendants (MLDs) for the Los Vaqueros Project regarding their knowledge of the region.

Most MLDs knew a great deal about their family histories in the Livermore-Pleasanton area during the 20th century, and the older MLDs also knew about late 19th-century family history. One MLD now in his 70s grew up 1 mile north of the Los Vaqueros Project site. He was knowledgeable about the use of plants and rockshelters in the area. Several MLDs told creation stories relating to Mount Diablo and the area to the east. All Ohlone/Costanoan and Ione Miwok MLDs could trace their family histories in the Livermore-Pleasanton area back to the 19th century.

The research conducted for this section indicates that a wealth of information and research potential exists to develop a detailed history of Native American presence in eastern Contra Costa County. For instance, during the early ethnohistoric period (approximately 1780), the area around Kellogg Creek was the contact zone for four linguistic groups: Bay Miwok, Ohlone, Yokut, and Plains Miwok. This juxtaposition of groups permits research of intergroup relationships, such as trading, intermarriage, and intergroup conflict. Information from this area would be applicable to regional studies of central California; to the dynamics of intergroup relationships throughout the state; and to the theories of intertribal political, economic, and social relations.

The following is a synthesis of information regarding Native American use of the Los Vaqueros area during prehistoric and historic times.

Native American Prehistory

Los Vaqueros was probably not the permanent home of any tribe when the first Euroamericans entered eastern Contra Costa County (circa 1780), because no permanent village sites have been found during archeological surveys of the upper Kellogg Creek area (Sonoma State Academic Foundation 1992). The Kellogg Creek area was bordered by four Native American linguistic groups: the Bay Miwok to the north, the Ohlone to the southwest, the Yokuts to the southeast, and the Plains Miwok to the east (Callaghan 1982).

The Native Americans who used the upper Kellogg Creek area may have occupied permanent villages in Round Valley or along Marsh Creek to the northwest, which have been attributed to the Volvon tribelet of the Bay Miwok (Fredrickson pers. comm.; Milliken 1982). Linguistic, ethnohistoric, and mission record evidence suggest that either the Volvon tribelet or the Saoam (Ohlone) tribelet used the Los Vaqueros area (Callaghan 1982; Milliken 1982). During the period immediately preceding Euroamerican settlement, the Volvon and Saoam tribelets had populations of at least 100 people each, according to the baptismal records of Mission San Jose and Mission Dolores (Milliken 1982).

Archeological sites in the project area are primarily temporary campsites, which suggests that the area was probably used for specific, temporary purposes, such as plant gathering and hunting. As elsewhere in California, it is presumed that people using the project area followed a seasonal round, gathering food in large quantities and using processing techniques to dry the food for long-term storage (Bramlette et al. 1991).

During fall and spring, grasses were burnt off while they were still damp and not a fire hazard. The ash from these controlled burns fertilized the soil, creating hillsides of seed plants and meadows to attract small animals, and cleared the growth under food trees to facilitate the fall harvests (Bramlette et al. 1991, Lewis 1973).

Establishment of camps in late summer and early fall served both economic and social purposes. Groups of women harvested and processed seeds and acorns, while men herded and harvested migratory animals. During this time, young men and women from neighboring villages could meet and court.

To protect against the summer sun, temporary ramadas were probably constructed near springs. The rockshelters and oak and buckeye trees also offered shade. Little or no clothing was worn (Callaghan 1982, Milliken 1982).

In the rainy winters, men hunted abundant migrating herds of large animals. The winter economic group was smaller and the time spent away from home was shorter than in summer. In the winter villages, men and women repaired their utensils and equipment. The main economic technology was basketry, with constructed items including gathering baskets, processing and cooking utensils, clothing, housing, and nets.

The tribes of eastern Contra Costa County were in contact with each other through trade and intermarriage, although most individuals did not travel far from home in a lifetime (Bramlette et al. 1991). The dynamic resource diversity between the grassy inland hills and the Delta marshlands resulted in a widespread trade network. Large trading villages were located along the Delta at Antioch, Concord, and Clayton (Kroeber 1962b).

As a result of intertribal marriage, many families spoke more than one language. This interrelationship is also evident in the mission records of marriage, baptism, and death (Callaghan 1982, Milliken 1982, Bramlette et al. 1991).

In a world without writing, religion functioned as the primary institution to maintain and transmit ideas about world order and cultural structure. Native California was made up of small tribes without chiefs or the centralized political apparatus of the state. Politics and religion were inextricably intertwined. A leader's role was both political and religious in scope and application (Davis 1988).

While political boundaries divided the tribes, religion united the people. Religion was the major organizing principle for the calendar, the economy, cycles of social life, trading networks, political leadership, intertribal relations, and postcontact population movements. Astronomical observations, medicine, and geography were closely related to religion, and art was a means to express these ideas (Davis 1988).

Exotic materials were traded between tribes and used in ceremonies. Religious leaders from several tribes met at intertribal ceremonies to celebrate and renew the world order. Religious mythology transmitted cultural values and the principles and processes of world order from generation to generation. The religious calendar organized the year by marking and predicting harvest seasons and matching them with ceremonies and astro-

nomical events. Religion was the primary adaptive mechanism for cultural persistence and yet acted as a powerful agent for Native Americans adjusting to cultural change (Davis 1988).

It appears that the Los Vaqueros area was used for religious activity, as indicated by temporary camps located near and in the Vasco Caves, and by early references to "Indian ceremonial sites near Mt. Diablo" (Contra Costa Water District 1992). Vasco Caves at Los Vaqueros and Walker Caves at Brushy Peak have been painted with images of possibly religious nature, and both caves are located along the sight line of the winter solstice from Mount Diablo (Bramlette et al. 1991, Contra Costa Water District 1992). Similar painted caves are also located at Buena Vista Peak near Ione, along the summer solstice line from Mount Diablo. The Ione area was the resettlement location of some eastern Contra Costa County Native Americans after the missions were secularized. Round Valley, the possible home of the people who used Los Vaqueros, is related in mythology to Mount Diablo, Vasco Caves, Walker Caves, and Brushy Peak, and is also located along the winter solstice sight line from Mount Diablo (Contra Costa Water District 1992).

The Diablo religious district was shared by many distinct political tribes whose religious leaders likely gathered periodically to renew the world system. Only the religious leaders would have known the boundaries of the Diablo political-religious region (Contra Costa Water District 1992).

The Historic Period

1770-1803: Explorers, Disease, Military Force, and Missionization of Native Americans, and Native American Resistance. The first non-native explorers to come through Contra Costa County were from the Spanish missions: Fages in 1772 and Anza in 1776. Sal led an expedition over Altamont Pass in 1795. For over a month in 1805, Arguello scoured Livermore and Diablo Valleys to bring the remaining Native Americans into the missions (Milliken 1982, Bramlette et al. 1991). Moraga took an exploring party over Altamont Pass in 1808 (Beck and Haase 1974).

The missions sent out military teams into the county to recruit and coerce Native Americans. With a series of aggressive sweeps, all 100 Saoam people were brought into Mission San Jose between 1803 and 1805, and all 100 Volvon were brought into Mission San Jose and Mission Dolores in 1805 and 1806 (Milliken 1982, Bramlette et al. 1991).

The world was in upheaval for Native Americans during this period. At least one epidemic occurred, carried by runaway Saclan and Huchiun people from Mission Dolores in 1795, that likely affected many native people of eastern Contra Costa County even before they went to the missions (Milliken 1982). Within 20 years of contact with Euroamericans, most of their people were permanently removed from their homes or died in great numbers from epidemic diseases. The old ways of protection and resistance did not work against the new dangers, and Native Americans were just beginning to develop new strategies of survival and cultural persistence. From the beginning, Native Americans were drawn back to their homelands and escaped from the missions to find their way back to their tribal territories. The Spanish tracked down the runaways, punishing some, killing some, and taking the

survivors back to the mission. In 1806, the powerful Volvon tribe from the Diablo District organized a resistance movement against the raids (Milliken 1982).

1803-1834: The Mission Era. Soon after being brought to Mission San Jose, the Saoam and Volvon were exposed to the measles epidemic of 1806 (Milliken 1982). Life at the missions was structured toward changing the beliefs and behavior of Native Americans. However, the native people continued to practice their religions, in public if they could, but more often in private and secretly even in the sure knowledge of punishment if the mission padres caught them worshiping in the old way. The Kuksu Cult may have appeared in the missions during this period (Callaghan 1982). The aboriginal political affiliations among tribes were apparent in the sociology of mission life, with intertribal marriage occurring among allied tribal groups (Milliken 1982).

Although some of the Native Americans at Mission San Jose lived and worked at the mission, others were sent to the mission ranches of eastern Contra Costa County, probably to Los Vaqueros, as laborers and cowboys. The Saoam or Volvon who survived the epidemics may have been chosen to return to their homeland, the land they knew, to work on the mission cattle ranches in Livermore Valley and at Los Vaqueros. By 1828, Father Duran of Mission San Jose had drawn a map of mission lands on the frontier (including the entire Livermore Valley) as a summer cattle ranch from which cattle were moved, probably through Los Vaqueros canyon, to spend the winter in the Concord area (Milliken 1982).

The Mokelumne and Lokelumne (Plains Miwok people who trace their 19th-century family histories to eastern Contra Costa County) probably began their involvement in the area during the mission period. Between 1817 and 1835, 143 Mokelumne people were baptized at Mission San Jose. Fifty-two Lokelumne people were baptized at Mission San Jose between 1826 and 1834 (Levy 1978b).

The largest ethnic group at Mission San Jose consisted of the many tribes of the Plains Miwok, including the Mokelumne and Lokelumne, with 2,100 baptisms from 1811 to 1834 (Levy 1978b). Once taken to the missions, the Plains Miwok organized runaway groups to return to the Delta marshlands. By the 1830s, the missions were closing down and provided less services to their native populations. With disease killing their families and missionization destroying their cultures, many neophyte Native Americans chose the dangerous option of escaping from the missions to join the growing resistance movement of tribal and runaway Native Americans led by Miwok leaders from the Delta and the Sierra Nevada foothills. In time, runaway Native Americans learned the methods of their captors and began to retaliate against the missions and frontier settlements (Beck and Haase 1974).

Expeditions were sent from the missions to capture runaway neophytes and to punish Native Americans raiders (Beck and Haase 1974). Sanchez led Spanish attacks against Native American villages along the Mokelumne River in 1819 and along the Cosumnes River in 1825.

Instead of becoming involved in resistance activities, many Native Americans stayed at the missions, adapting to the requirements there by learning the new roles of laborer and cattle herder, and adjusting culturally through religious interpretation and revitalization,

conducting traditional dances and the new Kuksu ceremonies (Milliken 1982). For those who remained, the mission period was a time of Native American adaptation to the imposed order, an adjustment of the old traditions to new circumstances and, in many ways, the persistence of the old moral order within the Native Americans community. Although there was a new day-to-day intertribal sociology at the missions, with caste divisions between the Native Americans and non-Native Americans, the continuation of the old intertribal marriage alliances was an example of what must have been a variety of tribal boundary maintenance behaviors within the uncomfortable intertribal intimacy of the mission walls (Milliken 1982).

1834-1849: Ranchos, Vaqueros, and Native American Raiding. The new Mexican government in California intended to separate itself from the administration of the missions through the Secularization Law of 1834 by passing mission lands into the hands of the remaining mission Native Americans, with only unclaimed land to be deeded to Mexican ranchers. However, the mission fathers reported that all the Native Americans had died so that the vast mission land holdings would be deeded by the Mexican government to non-Native Americans.

The Kellogg Creek area, considered a grazing tract on the eastern frontier of desirable mission lands, was included in the deed to the Los Meganos Rancho given as a Mexican land grant to Jose Noriega in 1835. He sold it to an American, John Marsh, in 1837. In 1844, Marsh ceded the southern portion, including the majority of the Kellogg Creek watershed, to Francisco Alviso, Antonio Hiquera, and Manuel Miranda as the Rancho Canada de Los Vaqueros (Bramlette et al. 1991).

After the missions were secularized in 1834, many Native Americans returned to their homelands, but they lacked the survival skills of their parents. Some, including the Volvon and Julpun from Mission San Jose, went to work as laborers and vaqueros for the ranchos in their home territory of eastern Contra Costa County at the large cattle ranches at Los Vaqueros and Los Meganos (Milliken 1982).

The Mexican landowners considered the Native American workers an integral part of their ranches and allowed them to continue to live at traditional village sites (Milliken 1982). The Native American workers on the ranches were laborers and cowboys. An annual rodeo was held at Los Vaqueros, and skilled Native American vaqueros likely participated (Bramlette et al. 1991).

Marsh lived at Los Meganos from 1837 until his death in 1856. He initially built a small adobe house and later, in 1851, a stone mansion, probably with the help of Volvon and Julpun people. The Los Meganos Native American laborers also helped to plant a vineyard and an orchard, sowed the first wheat fields in Contra Costa County, and raised cattle (Bramlette et al. 1991).

Although stock raising was the main economic pursuit of the Los Meganos and Los Vaqueros ranches, Marsh and John Sutter were known to have exchanged Native American laborers for agricultural purposes at planting and harvesting times, thereby setting up a new

social network between the Ohlone/Bay Miwok and the Plains Miwok/Maidu (Villa and Dutschke 1982).

Native Americans east of the Delta and foothills did not settle into the laborer's class of Mexican society. The Plains Miwok from the Central Valley and Sierra Nevada Foothills organized intertribally into a resistance movement, shifting their social structure and changing their economic base to survive when their homelands were taken and their old lifestyle was no longer possible. The Plains Miwok had spent the last 10 years in the missions, dominating other tribes by their numbers. Other tribes had lived in the missions for up to 50 years. The Plains Miwok, however, were in the missions only long enough to learn some tricks from their captors without being away from their traditional life too long to have become submissive to the new order. They changed from peaceful, sedentary, localized groups into a unified semiwarlike, seminomadic, multitribal resistance movement (Beck and Haase 1974, Milliken 1982, Levy 1978).

In the 1830s, the Native American resistance routinely attacked the missions, ranchos, and towns, taking large numbers of horses and cattle and injuring or killing non-Native Americans (Milliken 1982). Plains Miwok and Yokut raiders probably crossed the San Joaquin River between Byron and Tracy, traveling across Altamont Pass to raid the ranchos in Contra Costa and Alameda Counties. The ranches most under attack were probably Los Vaqueros and Los Meganos, the westernmost ranches on the frontier of Mexican California and the least protected by the Presidio soldiers and therefore the most accessible and vulnerable to horse and cattle raiders from the east.

After control of California passed from Spain to Mexico in 1822, expeditions into the interior continued, but with a changed purpose. Instead of seeking inland sites for possible missions, soldiers were sent into the interior to recover stolen animals and punish hostile Native Americans and to reduce the attacks on towns, missions, and ranchos. In 1829, three expeditions were sent against Estanislao, a former mission Native American, leader of runaway Native Americans on the Stanislaus River (Beck and Haase 1974).

The secularization of the missions had once again drastically affected the lives of the Native Americans. Some tried to return to their old ways of life by returning to their traditional territory and found that survival was difficult without the social, material, and economic strategies they once had. Others continued to adapt to the changes by working on the Mexican ranchos as laborers and vaqueros, building adobe houses for the landowners, sowing and harvesting agricultural crops, practicing animal husbandry, and participating in rodeos. This allowed them to maintain a remnant of the traditional social structure because they were allowed to establish their own rancherias on the ranchos. However, their lives were as dependent slaves or serfs, and they were coerced into long-distance labor exchanges between ranch owners, which in turn led to new social ties between Miwok, Ohlone, and Maidu people.

Other Native Americans continued to live the risky lives of resistance fighters in the resistance movement centered in the Delta and Sierra Nevada foothills. While the warriors and raiders lived a Native American way of life, it was a new way of life. Their homelands had been taken and their old lifestyle was no longer possible, so rather than adapt to the

lifestyle of the invaders, they had shifted their social structure and changed their economic base to survive. They changed from peaceful, sedentary, localized groups into a unified semiwarlike, seminomadic, multitribal resistance movement, facing the threat of constant military retaliation (Beck and Haase 1974).

1820-1840: American Mountain Men and Immigrant Parties. During the 1820s to 1840s, American mountain men like Jedediah Smith, Ewing Young, and Joseph Walker traveled through the Bay Area and over Altamont Pass to Mokelumne and Lokelumne territory, trapping beaver along the San Joaquin and Sacramento Rivers. Although the trappers' policy was to avoid conflict, their presence added to the already volatile situation of Euroamerican-Native American conflict (Beck and Haase 1974).

Following the routes that these explorers had forged, American immigrant parties began arriving overland into California. The Bartelson-Bidwell immigrant party traveled down the Stanislaus River and stopped at Marsh's ranch in 1841 (Beck and Haase 1974). Marsh was the only American landowner in this area of Mexican land grants, and his ranch became a major rest stop for the American immigrant parties.

Although the American explorers and trappers were the first white men Native Americans had seen in some areas of the state, this was not the case for the Ohlone and Miwok in the Bay Area, Delta, and foothills. It was probably unnecessary for the Native Americans to adapt to these foreigners, because they stayed in an area for only a day or two and their policy toward Native Americans was nonaggressive. The major contribution of the American explorers was in the diaries they kept of their journeys.

However, the situation between Native Americans and settlers was different. The settlers required land and took it forcibly from Native American inhabitants. Their homesteads were targets for Native American horse and cattle raids. Although a homestead family did not put up much of a fight against the hit-and-run tactics of raiding Native Americans, citizen militias retaliated against Native American family settlements with genocidal brutality. Local newspapers recorded the elimination of Native American populations with self-righteous fervor.

During this period, Native American populations decreased drastically. Because they could not settle on any land, they could not practice their natural harvest and storage economy. While tens of thousands of Native Americans survived the missions, only a few thousand survived the settlers (Cook 1976).

1845: The Bear Flag Revolt. In the early days of the Bear Flag Revolt (the American overthrow of the Mexican government in California) John Charles Fremont led a small force in 1845 from Truckee's Pass to San Francisco, crossing the San Joaquin River around Antioch and traveling north of Mount Diablo through Clayton to Oakland (Beck and Haase 1974). His American military presence added to the waves of foreigners moving into Native American land east of Mount Diablo.

1849-1860: The Gold Rush. The Mother Lode was located in the hills directly west of Mokelumne and Lokelumne territory, near Jackson and San Andreas. The Plains

Miwok, including the Mokelumne and Lokelumne, who had been raiders a decade before, went to the Ione area during the Gold Rush. Some Native Americans worked in the gold mines, especially for large mining operations in the early days. However, when thousands of miners invaded the Mother Lode, individual mining claims took over most of the Sierra Nevada gold country, and thousands of Native Americans were killed by miners and settlers (Levy 1978b).

Other Miwok and Ohlone stayed in eastern Contra Costa County to work as laborers and vaqueros on the ranches and farms in the Los Vaqueros area, Livermore, and Pleasanton (Contra Costa Water District 1992). The need for cattle as meat, rather than for hide and tallow, increased with the influx of thousands of men during the Gold Rush.

The principal crossing of the San Joaquin River in the northern San Joaquin Valley was probably located at Stockton, where the Gold Rush routes from Oakland and San Jose crossed the river. The route had a stopover at Marsh's ranch and passed next to Los Vaqueros (Beck and Haase 1974). The area's non-Native American population was larger than it had ever been.

The Gold Rush was the most destructive era for Native Americans. Native Americans under the protectorship of non-Native Americans were the only ones to survive this era.

1851: Treaty Commissioners and the U.S. War Department. Because of the increasing conflict between the American miners and the indigenous people of California, the U.S. War Department sent treaty commissioners to negotiate treaties with California Native American leaders, promising them reservation territory and sovereign nation status in exchange for ceding their lands to the government. The Treaty of Camp Fremont was signed on March 19, 1851, for the Native Americans of the Bay Area. The Treaty of Camp Cosumnes was signed on September 18, 1851, for the Native Americans in the Sierra Nevada foothills around Ione. None of the California treaties were ratified by the U.S. Congress. However, after the treaties were signed, the status of Native American people and their rights to aboriginal land changed.

1851: The Land Grant Commission. The Land Commission of 1851 established the ownership and territories of the Mexican land grants (Beck and Haase 1974). The Los Vaqueros case continued for decades. Los Vaqueros was gradually subdivided into tenant farms, which negatively affected the Native American people living and working in the area. The large land grant cattle ranches required cheap Native American labor and permitted Native American workers to maintain their social structure by allowing them to live in rancherias within the ranch boundaries. When the ranches were subdivided into tenant leases, the Native Americans were forced to either leave the ranches or break up their rancherias and work individually on the new smaller ranches (Levy 1978b).

1850-1900: Cattle Ranching, Subdivision of Land, and Religious Revitalization. Transportation and communication were developing in the Los Vaqueros area in the late 19th century, with the stagecoach line passing through Byron and Brentwood (near Los Vaqueros), and the Tulare Railroad passing only 2 miles from Los Vaqueros ranch by

1873. Some Native Americans were living on or near the ranches, working as laborers and vaqueros and possibly in the construction of the railroad (Milliken 1982).

Although from 1847 to 1900, the U.S. War Department was responsible for handling the conflict between the settlers and the Native Americans, to protect the settlers from the Native Americans and to protect the Native Americans from attacks by the settlers, the army did little to help the native people of the Bay Area and Ione. Native Americans died at a high rate from disease, such as the Contra Costa epidemic of 1853, and from the attacks of miners and settlers (Milliken 1982). The native people in both areas were suffering, and their traditional cultures continued to disintegrate. Native Americans of eastern Contra Costa County adapted by working in the lower ranks of the laboring class of American society.

During this era, most of the Mokelumne and Lokelumne ended their stay in eastern Contra Costa County and moved permanently to Ione. They lived partly by traditional hunting and gathering and partly by seasonal labor (Levy 1978b). In the late 19th century, the plight of the Miwok in the Ione area was recognized. Two federal rancherias and one private rancheria were set aside for the Native American communities: the Buena Vista Rancheria, established in the late 1800s; the Jackson Rancheria, established in 1893; and the Moffitt land, established in the late 1800s (Contra Costa Water District 1992).

The Ghost Dance religion spread through this area during at least two surges of religious revitalization: in the 1870s when prophets came from Pleasanton-Livermore, and in the 1890s (Villa and Dutschke 1982). Reports also exist that the Kuksu religion, a native revitalization religion, was being practiced in the Diablo area (Callaghan 1982). Intertribal religious ceremonies and regional gatherings were reportedly also being held at the base of Mount Diablo in the late 19th century (Ortiz 1989). Reports of these various religious activities are probably related.

Mission San Jose continued as a viable institution in the Native American communities and a central religious institution for converted Catholic Native Americans, with an orphanage and other programs for the Native American community (Contra Costa Water District 1992).

1900-1940: Ranching, Farming, and Cultural Disintegration. The Ohlone families that lived in eastern Contra Costa County at this time worked as laborers on farms and cattle ranches or worked on construction projects of the Balfour-Guthrie Company, which owned Los Meganos Ranch. Many of these families stayed in eastern Contra Costa County until the 1940s (Contra Costa Water District 1992).

Most of the Ohlone families stayed in the towns of eastern Contra Costa County, Livermore, Pleasanton, Dublin, and Brentwood. Some Native Americans went back to Mission San Jose as orphans or to live on mission land (Contra Costa Water District 1992).

During this era, some families moved into non-Native American communities, especially Mexican-American families, and began to publicly identify themselves as Mexican-Americans. The sense of indigenous heritage (which traditionally had been expressed as an identification with a tribal community located in a specific geographical area) was being replaced with an increasingly uninformed sense of Native American identity. However, a strong sense of extended family remained for many, as noted by family reunions and expressed as a high regard for elders and their knowledge (Contra Costa Water District 1992).

1940-1975: Little Native American Activity at Los Vaqueros. Most Ohlone families moved away from the Livermore-Pleasanton area during this time and used the hills and streams occasionally for family gatherings (Contra Costa Water District 1992). Family gatherings continued to be an important way of transmitting and expressing Native American cultural background, through telling stories of family history.

1975-1992: Renaissance of Interest in Eastern Contra Costa County. With the development of various projects in eastern Contra Costa County over the last 20 years, the wind turbines, and various Los Vaqueros projects, Ione, Miwok, and Ohlone people have begun to talk to older family members about their histories specific to this area. As they hear about or see the Vasco Caves, they express a strong emotional and spiritual connection, generally and specifically regarding ties to the creation stories and sacred geography around Mount Diablo (Contra Costa Water District 1992).

A statewide California Native American religious revival has been developing dramatically in the last decade, and a growing public interest in Native American culture and history has also increasingly encouraged Native American descendants to turn their attention toward finding out about their ancestral ways. Dutschke, a Miwok MLD, works for the State Office of Historic Preservation.

Since the 1970s, California and U.S. laws have required land developers to notify Native Americans when burials or cultural resources will be disturbed by development. In the late 1970s, the Native American Heritage Commission was established in California to assist developers to locate and contact the MLDs for any area of the state. This has generated a great deal of interest among Native Americans in working on projects of culture and history and learning more from their elders. The MLDs involved in the Los Vaqueros Project have all worked with other public or private land developers on the disposition of burials and cultural resources.

1992: Contemporary Native Americans Concerns. California state law mandates that Contra Costa Water District contact the individuals on the MLD lists for eastern Contra Costa County about the Los Vaqueros Project. However, several Miwok and Ohlone Native American organizations exist whose MLD and non-MLD members have a history in eastern Contra Costa County.

The organized Ohlone groups with an interest in the Los Vaqueros Project are the Muwekma Tribe and the Ohlone Tribe. The organized Miwok groups with an interest in the Los Vaqueros Project are the Jackson Rancheria, the Buena Vista Rancheria, the Ione Band

of Miwok Indians, the Ione Band of Indians, and the Amador Tribal Council. The Jackson Rancheria and the Buena Vista Rancheria are federally recognized. The other Native American organizations are not federally recognized, although the Muwekma Tribe and the Ione Band of Miwok Native Americans are seeking federal recognition.

The Ione Miwok and Ohlone MLDs interviewed are now intensely interested in participating in the Los Vaqueros Project (Contra Costa Water District 1992).

Cultural Context for Historic Archeology

As discussed below for the theoretical orientation for historical archeology, it is necessary to understand the historical context to determine the importance of historic-period resources, especially within the framework of a district. The following provides the historical context statement and supporting data for the project area.

Between 1834 and 1846, more than 800 patents of land, constituting more than 12 million acres, were issued to individuals by the Mexican government in what is now California (Lavender 1976). Sixteen of the final 813 grants were in present-day Contra Costa County (Beck and Haase 1988). The lands granted by the Mexican government were known as ranchos. Under the rancho system, land outside of towns was considered valuable only for grazing purposes; thus, any citizen of good character with cattle and funds for fees and taxes could get a grant for a grazing tract. Grantees were required to submit a diseno (i.e., a description and map) of the area they desired. The rancho boundaries marked on the disenos were usually vague and indicated only by major landmarks.

Francisco Alviso, Antonio Hiquera, and Manuel Miranda (three brothers-in-law) were awarded Canada de Los Vaqueros (Valley of the Cowboys) on February 29, 1844. Three years before being granted the land, Alviso had already built a large corral and stocked his ranch with livestock. The three grantees probably did not reside full time at Los Vaqueros; they did, however, take an active role in supervising the Californios and Native Americans in their employ. These employees lived in a wooden house on the ranch (Land Case #79:7-19).

Stock raising was the main economic pursuit during the Mexican period. Land was not developed for agricultural purposes more intensive than subsistence-level farming. With a relatively sparse and scattered population and a poor transportation system, commercial agriculture was not economically feasible during this period in most locales. Because ranchos were not fenced, cattle and other stock roamed at will and mixed with stock owned by neighboring rancheros. At least once a year a rodeo was held and each ranchero herded his own stock back to his land. Los Vaqueros rancho reportedly contained a rodeo site (DeNier 1928).

The first building erected on a rancho was usually of either wattle or palizada construction. Palizadas were easily constructed log buildings chinked with mud and tules

that served to prove a claimant's intention to settle. More permanent adobe structures were usually constructed after the land claim was confirmed.

On July 7, 1846, following the declaration of war between the United States and Mexico, Commander Sloat claimed California for the United States, causing a minor influx of Americans to California. When the first Americans arrived, Mexican livestock grants covered most of the best land, curbing settlement. The prior claim of the Mexican grantees, however, did not stop the influx of immigrants, and many squatters eventually appeared throughout the county following the announcement of the California gold fields in 1848 (Smith and Elliot 1879). Many Gold Rush immigrants sought land to take up ranching and farming.

Mexican land grants were written that gave the boundaries of one claim as that of another; Los Meganos, for example, was described as being bordered by Los Vaqueros to the south. As finalized by the U.S. Land Commission, these grants often contained much less land than that originally described; the land grants became surrounded by public land that could be settled and purchased from the General Land Office.

In 1847, Francisco Alviso and Isabella Miranda, his wife, sold their interests in Los Vaqueros to Noriega and Livermore, who also owned the Rancho Los Positas to the south (Land Case #79:41). Livermore and Noriega filed a claim for Los Vaqueros and Los Positas in February 1852. Noriega also hired an attorney to settle his land problems. The attorney worked out an agreement whereby Livermore received Los Positas, while the attorney and Noriega each received a half interest in Los Vaqueros. The attorney sold his half interest to William Akenhead, while Noriega sold to Maximo Fernandez. Akenhead lost his property because of an unpaid debt; Juan Sunol purchased it at a sheriff's sale. Both halves were sold in separate transactions on November 14, 1857. Lorenzo Sunol purchased a half interest from Fernandez, and Juan Baptiste Arrambide, Bernardo Altube, Bernard Ohaco, and Charles Garat purchased Juan Sunol's half from its current owner, Ellen Garat. These two owners lived on the rancho in 1860 and are listed on the census.

Lorenzo Sunol, a native of Spain, probably lived with his two laborers at the "upper adobe" (CCO-450/H) recorded by Hendry and Bowman (1940) and shown as "Sunal" on an 1873 map (California Geological Survey 1873). On the 1860 U.S. Census Agricultural schedule, Lorenzo "Senole" claimed 7,750 acres, of which only 2 were improved. Sunol used the land for cattle ranching. Arrambide, Altube, and Ohaco probably lived at the "lower adobe" (CCO-470H). Arrambide and Ohaco were French; Altube was Spanish. Altube's household included his French wife and infant daughter, Arrambide; three members of the Ohaco family; and four other persons of French, Spanish, and Native American descent. Of their 8,880 acres, only 5 were improved. The remaining acreage was used to graze 1,280 head of stock cattle and 50 horses worth $17,750.

Bernardo Altube and Juan Baptiste Arrambide were among a group of 80 persons with Basque surnames who emigrated from Buenos Aires around 1850. The Basques had done well in Argentina, and it is this Argentine contingent for whom the term "bascos" as a reference to Basques rather than vizcainos is derived (Douglass 1975). Bernardo joined his brother Pedro who was already in San Francisco. Five Altube brothers had emigrated

from Spain to Argentina, Pedro leaving in 1845. The brothers prospered in the Argentine cattle industry. Prior to 1850, three brothers decided to return to Spain; they liquidated their assets, and Bernardo and Pedro emigrated to California (Patterson et al. 1969). In the 1850s and 1860s, the Altube brothers were partners with other Basque immigrants in numerous cattle and dairy operations throughout the state. In approximately 1860, Bernardo Altube and Arrambide also had a cattle ranch in Calaveras County (Douglass 1975).

Although the Land Commission confirmed Robert Livermore and Jose Noriega's claim to Los Vaqueros in 1855, and Livermore and Noriega refiled their former transaction deeding Los Vaqueros to Noriega, considerable confusion regarding the title to Los Vaqueros ensued when Livermore died in 1858. Livermore's wife and eight children claimed Los Vaqueros based on a deed to them predating the Noriega transfer (Deeds 2:156-157). Similarly, each of grantee Antonio Higuera's four children inherited one-quarter of their father's interest, which was said to be one-third of the entire rancho (Deeds 8:160), while the remaining two-thirds were claimed by Alviso and Miranda. Meanwhile, Lorenzo Sunol and the Arrambide partnership each claimed a half interest and resided on the rancho.

By about 1860, various parties held deeded interests totaling over 200% of the Los Vaqueros rancho, half of these claims being in the hands of Livermore's heirs and Noriega's assignees and the rest held by descendants of the 1,844 grantees. Arrambide, Altube, and Ohaco sold their half interest in 1863 to a San Franciscan who quickly transferred the property to Louis Peres and Pedro Altube, Bernardo's brother. Peres and Altube gradually purchased the interests of eight of Livermore's heirs and of Alviso. When Altube sold his interest to Peres in 1880, it purported to cover the entire 17,752-acre rancho (Deeds 39:282). During the same period, a wealthy Martinez family, the Blums, bought out Miranda and Higuera's heirs.

The public land surrounding Los Vaqueros was surveyed in the 1860s and 1870s, opening the area to permanent settlement. An individual could obtain a maximum of only 320 acres from the federal government, a very small holding in comparison to the thousands of acres that made up neighboring Mexican land grants. It was not until the early 1870s that patentees filed claims to government land surrounding Los Vaqueros, using a combination of homestead and cash entry patents to obtain small 320-acre ranches (e.g., CCO-562H, CCO-563H). The settlers in the hilly area west of the grant were predominantly Californios and Mexican immigrants. Many of these families lived on their land through 1880 but disappeared from the area by 1900. The public land between the Los Meganos and Los Vaqueros land grants and to the east of Los Vaqueros was settled by Americans and Northern European immigrants. The descendants of some of these settlers kept their holdings until the second half of the twentieth century.

Meanwhile, the nature of stock raising was changing. During the Mexican period, cattle had been raised primarily for the hide and tallow trade because there was no market for large quantities of beef. The California Gold Rush, however, created a huge demand for meat, and the orientation of ranchers changed dramatically during the cattle boom of 1850-1860. Improved cross-bred stock replaced the original Spanish breeds (Burcham 1957, 1961). The necessity of range improvements became immediately obvious when almost two

million head of cattle perished in the floods of 1861-1862 and the subsequent drought of 1863-1864. The first range improvements occurred due to this demise, after which ranchers planted various forage crops as a supplement to the natural vegetation (Burcham 1975). In addition, many ranchers began raising sheep from the 1870s, finding these animals better adapted to California's semi-arid climate (Burcham 1956, 1957, 1961).

The Altube brothers, and eventually the Arrambide and Garat families, "feeling crowded" by the changes in California, moved their cattle enterprises to Nevada. In 1871, Bernardo and Pedro Altube sold most of their California holdings; purchased 3,000 head of cattle in Mexico; and drove them to eastern Nevada where they settled. The Altubes created a thriving "cattle kingdom" on their Spanish Ranch (Patterson et al. 1969).

Louis Peres remained in California, where he is listed at Los Vaqueros on the 1880 census with his wife and young daughters, their governess, his invalid brother, three farm laborers, and a Chinese cook. Peres and his employees were French. By this time, the land grant had been divided into at least five rented parcels. The family of one of the lessees, Sylvan Bordes, lived on the grant through the 1930s.

In 1881, a mortgage taken out on Los Vaqueros by Peres and Altube was approaching foreclosure. At that time, the interests in the rancho that had been sold to Peres and Altube and to Blum were broached, and a settlement was suggested by the mortgage holder who had purchased Akenhead's interest to the property at a probate sale in 1868 (Deeds 15:428), despite the sale by Sheriff's Deed of this same property more than 10 years before (Deeds 5:196). Peres and Altube's mortgage "purported to cover the entire Rancho Canada de Los Vaqueros, whereas Simon Blum claims title as owner of two thirds of said Rancho" (Deeds 39:425). In 1881, Peres sold his claim to Charles McLaughlin, and in 1889 Blum sold his interest to Mary Crocker, McLaughlin's heir (Fredrickson 1982). Other claimants, including Lorenzo Sunol, continued to contest Blum's claim until the issue was settled in court in 1889 (Deeds 57:356; Patents 4:124).

A third factor entered into the disposition of land surrounding Los Vaqueros. In 1862 and 1864, Congress passed acts to aid the construction of a railroad and telegraph line from the Missouri River to the Pacific Coast. The Western Pacific Railroad was promised:

> every alternate section of Public Land designated by odd numbers to the amount of ten alternate sections per mile on each side of said Railroad on the line thereof, and within the limits of twenty miles on each side of said road, not sold, reserved or other disposed of by the United States, and to which a Preemption or Homestead claim may not have been attached at the time the line of said road is definitely fixed (Patent 1:237).

On February 1, 1870, it was reported that the telegraph line and railroad had been completed and equipped, and Charles McLaughlin, land agent and contractor for the Western Pacific Railroad, selected 111,527.57 acres of public land (Patent 1:237-251), including many of the odd-numbered sections surrounding the Los Vaqueros land grant.

McLaughlin subcontracted a portion of his contract to Jerome B. Cox, who never received full payment for his work. For 20 years, Cox fought McLaughlin in the courts. Each time a judgment awarded payment to Cox, McLaughlin's attorneys appealed and the decision was overturned. In frustration, poverty, and despair, Cox killed McLaughlin in 1883. Cox claimed self defense, with public opinion weighing so heavily in his favor that all charges were dropped at the preliminary hearing. At the time of his death, Charles McLaughlin was the second largest landholder in California, following only Leland Stanford. Kate McLaughlin outlived her husband by 5 years and left the large estate to her two nieces, Kate Dillon and Mary Crocker (Williams n.d.).

Following the final resolution of Los Vaqueros title disputes in 1890, Mary Crocker divided the property into a greater number of ranches that she leased out to tenants who practiced more intensive forms of agriculture. In 1929, Los Vaqueros was divided into 13 leased units (e.g., CCO-426H, CCO-569H). Many of these ranchers were immigrants from France, Italy, and Portugal. Some families continued their lease agreements on the property for over 30 years, passing them from parents to sons along with livestock and personal property on retiring (e.g., Miscellaneous Records 12:359). These tenant ranchers and the few surrounding owner-occupiers practiced mixed agriculture. They raised a little grain, wheat, and hay, and ran small dairy or beef cattle herds, sheep, pigs, horses, and poultry. In 1924, for example, the Fragulia family owned approximately 60 cows, 27 horses, 150 sheep, and 25 pigs (Miscellaneous Records 12:359).

Although some of the Californio-Mexican population remained in 1900, recent immigrants from the Azores now resided in the former public land in the Black Hills to the west of the Los Vaqueros grant. The parcels of the original patentees generally had not been consolidated, but the Azorian ranchers owned or leased many noncontiguous 160- to 320-acre parcels to form larger holdings.

O.L. Starr purchased a 7,883-acre parcel from the Mary Crocker estate in 1935 (Official Records 396:16). At that time, the Vasco Road property was leased by an Italian family who lived on the west side of Kellogg Creek. Starr built his complex nearby on the east side of the creek, and the earlier ranch complex, including the site of an 1850s adobe, fell into ruins (CCO-470H). Starr made many improvements, including a new ranch house, barns (CCO-449/H, CCO-450/H), and water systems (CCO-451H, CCO-467/H). Starr raised cattle and sheep on the property, but he hired others to do this work while he concentrated on the early development of the caterpillar tractor. His father-in-law, Abraham Holt, began experimenting with track-laying tractors around 1904. After World War I, Holt, Starr, and Bess (formerly of Bess Tractor in San Leandro) merged and formed the Caterpillar Tractor Company. Starr, "a natural inventor", built the machine shed at the ranch and experimented with the Caterpillar. Starr and his men test drove tractors on the ranch (Ladd pers. comm.). Starr's ranch was held up as model of efficiency (Purcell 1950:198):

> Starr's cattle ranch on the Vasco is a model institution, equipped with caterpillar tractors and other modern farm machinery. Home buildings of Spanish architecture and landscaped grounds, spacious fireproof storage sheds with concrete floors, generating power plant and water system are but a few

of the features of the 8,000 acre establishment that is conducted on an efficient business basis.

Mrs. Edith Ordway bought this portion of the Starr Ranch in 1948 (Official Records 1168:195). Ordway razed Starr's residence and had a new residence built on its foundation.

Charles and Sue Nissen also purchased Los Vaqueros acreage from Crocker's heirs as an investment in the 1930s. The Nissens continued to reside in Livermore, where they had a hay and grain business and leased to Crocker's tenants, making improvements to the properties, including at least one residence (Nissen pers. comm.). The Nissen tenants moved their dwellings out of Los Vaqueros when the property was sold following the Nissens' deaths.

Los Vaqueros Outline History
(within Land Grant Only)

Year	Name	Association
1840	Francisco Alviso	Grantee, possibly resident at Upper Adobe, CCo-450/H
	Antonio Hiquera	Grantee, possibly resident at Upper Adobe, CCo-450/H
	Manuel Miranda	Grantee, possibly resident at Upper Adobe, CCo-450/H
1847	Robert Livermore, Jose Noriega	Alviso sells grant to Livermore and Noriega
1857	Lorenzo Sunol	Purchase half interest in Los Vaqueros; lives at Upper Adobe in 1860
	Juan Baptiste Arrambide, Bernardo Altube, Bernardo Ohaco	Partners purchase half interest in Los Vaqueros lives at Lower Adobe; CCo-470H in 1860
	Charles Garat	Purchase half interest in Los Vaqueros; lives in San Francisco; partner
1860s	Pedro Vasco, Pierre Pederio	Reportedly live at Upper Adobe
1863	Louis Peres, Pedro Altube	Purchases half interest of Arrambide et al.
1875	John Elliott	Purchases part of Los Vaqueros at county line; lives in Alameda County near Brushy Peak, outside of project area
1880	Louis Peres	Altube sells interest; Simon Blum also claims Los Vaqueros; Louis Peres lives at 470H with his wife, daughters, governess, farm workers, Chinese cook, and brother; Peres and his workers are French
	Sylvan and Minnie Bordes family	Lives on Los Vaqueros grant (426H) with daughter, visiting relatives, and farm workers; Mrs. Bordes was a Barnes from site nearby; they live on site through ca. 1940; French (possibly Basque)
	Frank Viala	Lives on Los Vaqueros grant with school teacher, disabled woman, and farm worker; Viala is French
	Johnson and Mattie Righter	Live on Los Vaqueros grant with two children, farm worker, and servant; Righter is from New Jersey
	Fred and Katie Dickhoff	Live at 453H with their three children and hired hand; Prussian

Los Vaqueros Outline History
(Within Land Grant Only)

Continued

Decade	Name	Association
	Louis Commey household	Lives at 569H with Chinese cook and five hired hands; Commey is from Missouri household on grant with four ranch hands, cook, and baker (Alexander Peres); four from France, one from Italy, and one from Azores
	Charles McLaughlin	Purchases Peres interest; McLaughlin very wealthy resident of San Francisco
1889	Mary Crocker (Kate Dillon)	McLauhlin heirs purchase Blum's interest; Lorenzo Sunol claim settled in court; Crocker very wealthy resident of San Francisco
1900	Thomas and Catherine Perata family	Leases tenant ranch at CCo-427H from prior to 1990 until ca. 1908; Italian
	Andrew and Mary Fragulia family	Leases tenant ranch at CCo-448H from prior to 1900 to after 1935; Italian
	John and Mary Silva family	Leases tenant ranch at CCo-470H; Lower Adobe from prior to 1900 to after 1910; may have followed directly after Peres; Portuguese
	Antone Rose family	Lease tenant ranch, CCo-445H, from prior to 1900 to before 1928; Portuguese; Waymouth place prior to 1900
	Anna Connolly and children	Leases tenant ranch, CCo-546H, from prior to 1900; Irish widow
	Frank Raffette sheep camp	Leases tenant ranch, CCo-446H from prior to 1900 until prior to 1928; French
1900	Joe Jason and family	Leases tenant ranch, possibly ALa-536H
1910	John and Angela Bonfante family	Lease CCo-427H from ca. 1908 to ca. 1928; Italian
	Nolan and Lillie Coats family	Leases 569H; lived with grown son; Californian
	Peter Dario	Leases property on grant; lives with widowed mother and sister; parents were French; possibly Upper Adobe
1917	Charles and Sue Nissen	Purchases Elliott's property from his estate
1920s	C. Rock	Reportedly lives at Upper Adobe (1921-27)
1921	John and Mary Vallerga	Lease tenant ranch at CCo-453H until prior to 1935; previous tenants include Joe Medina and Dickhoff

Los Vaqueros Outline History
(Within Land Grant Only)

Continued

Decade	Name	Association
1928	John and Palmira Cardoza	Lease CCo-427H from 1928 to an unknown date
	Stanley Cabral	Leases CCo-470H, resided there
	Frank N. Cabral	Leases CCo-445H, CCo-446H, lived elsewhere
	Frank Ferrario	Leases CCo-569H through 1935; prior tenants include William Souza, Nolan Coats, Commey
1935	Redin	Leases ALa-536H; raises sheep; possibly Basque
	Sam Lasuretta	Leases tenant ranch at CCo-453H
	Oscar Starr	Purchases 7,883-acre parcel from Crocker estate, including Upper and Lower Adobe; builds new complex at Lower Adobe and other improvements
1936	Charles and Sue Nissen	Purchase portion of Crocker estate
1948	Edith Ordway	Purchases portion of Starr Ranch, including Upper and Lower Adobe; built new residence at Upper and Lower Adobe

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Attachment 4. Fish and Wildlife Coordination Act Compliance

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Introduction

This attachment presents Reclamation's responses to recommendations presented by the U.S. Fish and Wildlife Service (USFWS) in the Fish and Wildlife Coordination Act (FWCA) report (U.S. Fish and Wildlife Service 1993). The full report is available for review at Reclamation and CCWD offices.

Reclamation's analyses and responses to recommendations are organized in the same order and major categories as the FWCA report. Comment numbers within each section refer to the number in the FWCA report, except that numbers for subchapters (e.g., 7.3) were combined with recommendation numbers for clarity (e.g., 7.3.1, 7.3.2). The text of each USFWS recommendation is presented first, followed by Reclamation's response.

Many of the recommendations in the report are identical or similar to measures that the Contra Costa Water District (CCWD) has already adopted or has proposed in the draft Stage 2 Environmental Impact Report/Environmental Impact Statement (EIR/EIS) (Contra Costa Water District and U.S. Bureau of Reclamation, Mid-Pacific Region 1992) (see "Impact Conclusions and Environmental Commitments", Chapter 19). Reclamation has rejected or modified some of the recommendations proposed in the FWCA report.

The bases for Reclamation's decisions are specified in the following specific analyses and responses.

7.1 Terrestrial Resources Recommendations

Recommendation 7.1.1

Develop, in cooperation with the Service and DFG as appropriate, additional performance standards for measuring the success of wetland and riparian habitat recreation efforts based on actual use of the mitigation sites by target species.

Analysis. CCWD is continuing to incorporate the needs of the wildlife species and communities, including evaluation species identified by USFWS, into criteria to evaluate habitat. The needs of the wildlife species were explicitly incorporated into the design of wetland and riparian mitigation habitats (Jones & Stokes Associates 1992a, 1993a) and into evaluations of wetland and riparian habitat values (Contra Costa Water District 1992, Jones & Stokes Associates 1991a).

CCWD included several evaluation criteria in addition to wildlife species use (e.g., sensitive plant species, plant community diversity, and hydrologic function) in its evaluation of wetland habitats. This approach provides a more complete community-based analysis for wetlands than one strictly focused on wildlife species and guilds.

Response. Reclamation modifies the recommendation to specify that CCWD should proceed with project planning based on CCWD's past impact analysis and mitigation planning approaches. Reclamation also will add to the recommendation that CCWD continue to work with USFWS to incorporate the needs of USFWS evaluation species as appropriate.

Recommendation 7.1.2

Monitor golden eagle nesting success in areas where eagles could be disturbed by construction, reservoir inundation, or recreational development and activities. Eagle nesting success should be monitored several years before, during, and after such construction, inundation, and development. Should monitoring reveal increased rates of abandonment of nests containing eggs or unfledged young, or a decrease in the number of young fledged per nest, remedial actions should be taken. Possible remedial actions should be developed in advance, in cooperation with the Service and DFG.

Analysis. Monitoring of all golden eagle nest sites in the Kellogg Creek watershed is unnecessary because some nest sites are located far from any potential disturbance. Also, some potential disturbance by recreation development would not occur for 10-20 years. CCWD has already proposed to monitor nest sites that could be affected by construction activities and to undertake appropriate measures as required (mitigation measure 8-6 in the draft Stage 2 EIR/EIS).

The abandonment of any golden eagle territory is considered unlikely because only a small amount of habitat would be affected (maximum loss is 22% in one territory) and enhancement of watershed habitat (elimination of ground squirrel poisoning and reduced grazing intensity) is expected to offset the loss of habitat acreage. Previous studies (Jones & Stokes Associates 1989, 1991b) show that golden eagles move their nest sites regularly in the watershed. Also, golden eagles' tendency to use typical oak trees as nest sites ensures many alternative nest sites are available. Therefore, eagles are likely to be resilient to anticipated levels of disturbance.

Response. Reclamation modifies the recommendation to state that eagle pairs with nests near the inundation zone shall be monitored for several years before, during, and after inundation, and that impacts of future recreation facilities be evaluated and monitored when facilities or recreation uses are specifically planned. If potential impacts are identified, remedial measures will be developed in cooperation with USFWS and DFG. This modified recommendation is consistent with existing commitments in the Stage 2 EIR/EIS.

Recommendation 7.1.3

Restrict additional development within 0.5 mile of any active golden eagle nest. While this distance may be modified based on the particular circumstances (e.g., topography) of each nest site and potential disturbance, it should be treated as a general guideline and any modifications as exceptions. Establishment of suitably large buffers where eagles may be disturbed by recreational activities is especially important; where disturbances are ongoing, predictable, and relatively constant, buffers need not always be as large.

Analysis. This recommendation is not supported by scientific evidence and information obtained in studies at the project site (Jones & Stokes Associates 1989, 1991b) and elsewhere in the literature. Eagles currently nest successfully within 0.5 mile of Vasco Road, residences, fire roads, and other constructed features. The need for protection during recreation planning is best determined by site, based on the specific types of disturbance (e.g., noise levels, duration, and timing), protection provided by topographic and vegetation screening, and individual tolerance of birds.

Response. This recommendation is not reasonable or justifiable. The recommendation is unacceptable because it is unduly restrictive and unreasonably costly and offers no concomitant benefits.

Reclamation modifies the recommendation to specify that when future recreation development is proposed in potential golden eagle nesting and foraging habitat, CCWD will evaluate effects on a site- and project-specific basis during project planning and provide appropriate mitigation to reduce impacts as much as possible. Mitigation measures may include establishment of buffers and seasonal restriction on use of facilities.

Recommendation 7.1.4

Initially restrict livestock grazing in wetland and oak habitats to the period from November 1 to June 1 or 15, depending on the growing season. The impacts of this seasonal restriction on other resources should be monitored; if this monitoring reveals significant adverse Impacts on, for example, erosion or fire control, the seasonal restrictions may be modified. Modifications should be made after further consultation with the Service.

Analysis. Grazing has occurred in oak and wetland habitats for a substantial period of time. CCWD's land management will most likely result in reduced grazing in wetland and oak habitats. CCWD will continue to review grazing levels in all habitats on a site-specific basis to determine whether adjustments are necessary. Grazing must be balanced with the need to prevent erosion and to minimize supplemental feeding in winter, and the need to maintain appropriate levels of grazing to minimize wildfire risks. Strictly limiting grazing in wetland and oak habitats to November 1-June 1 (or June 15) may not be appropriate given these requirements.

Response. Reclamation modifies the recommendation to specify that CCWD should consider habitat values in its grazing program and should evaluate and implement practices that enhance oak and wetland habitats, consistent with other management needs for biological resources (e.g., kit fox) and other resources (e.g., fire control and water quality protection). These issues will be addressed in the watershed management plan that CCWD has committed to prepare. Specific restrictions on the season of grazing will be addressed in this later plan.

Recommendation 7.1.5

Consider, as an enhancement measure, discontinuing dryland farming. Restoration of dry farmed areas to annual or native grasslands would benefit kit foxes, salamanders, small mammals, and raptors. If new stock ponds are created in these reconverted areas, additional habitat would be developed for a variety of amphibians, small mammals, and migratory birds. As with other stock ponds, they should be no more than 0.5 mile apart. To discourage use by bullfrogs and introduced fish, ponds should be designed to dry out by July or August each year.

Analysis. CCWD's acquisition and proposed grazing management practices and the elimination of widespread rodenticide use will substantially improve the condition of annual grasslands in the watershed. CCWD is committed to maintaining agricultural uses of the watershed. The CCWD Board of Directors adopted findings for the Stage 1 EIR for the Los Vaqueros Project and Resolution 88-45, which call for continued agricultural operations in the watershed. If, in the future, CCWD does not receive requests from lessees to continue dryland farming, CCWD will consider allowing these areas to revert naturally to grasslands. In addition, courts may limit the interests that CCWD can acquire, which may preclude CCWD's ability to affect agricultural operations.

Response. Reclamation rejects this recommendation for the reasons described above. Construction of additional concentrated stock ponds in the area as discussed in this recommendation would be impractical. Jones & Stokes Associates' analysis of pond construction feasibility indicates that opportunities to construct new ponds are limited because existing ponds in the area have largely used the available precipitation and runoff at the project site.

Recommendation 7.1.6

Retain ownership of all mitigation ponds to be created or enhanced along the relocated Vasco Road. Alternatively, CCWD or Reclamation could acquire conservation easements requiring that the ponds be maintained and used as described in the mitigation plan.

Analysis. The stock ponds to be replaced and enhanced along the relocated Vasco Road have been under private ownership and have had no perpetual protection or management. The new stock ponds would be replaced before road construction and will provide adequate habitat values to replace the affected ponds. CCWD will not retain ownership of lands along all portions of the relocated Vasco Road. Two of the three ponds to be created and one of two ponds to be acquired will be owned by CCWD. Ponds to be constructed on lands acquired by CCWD will receive greater protection than the affected ponds currently receive; those that will remain in private ownership will receive the same low level of protection as existing ponds on private lands.

Response. Reclamation rejects this recommendation because the planned mitigation is sufficient, and acquiring ownership of or easements for the remaining ponds would be unreasonably costly.

Recommendation 7.1.7

Acquire additional acreage for valley oak mitigation. The Service has determined that about 394 acres would be needed to compensate for lost values of valley oak woodlands. CCWD, in cooperation with DFG and the Service, should develop additional areas within or adjacent to the watershed for valley oak woodland as well as oak savanna restoration. The horticultural methods, success criteria and monitoring periods described within the Oak Mitigation and Restoration Plan appear to be adequate.

Analysis. CCWD will, based on agreements with USFWS and Reclamation, plant 375 acres of valley oak habitat, plus approximately 19 acres for valley oak habitat that may be affected by future recreation facilities.

Response. Reclamation modifies this recommendation to state that CCWD will recreate up to 394 acres of valley oak habitat on lands currently planned to be under CCWD ownership and taking into account the availability of suitable soils, adequate water supplies for initial irrigation, and depth to the water table.

Recommendation 7.1.8

Develop, in consultation with the Service and DFG, a mitigation and monitoring plan for impacts on blue oak woodlands. Although CCWD intends to purchase and protect more than 4,000 acres of existing blue oak woodlands, additional acreage is needed to mitigate for the 67 acres that will be lost due to permanent impacts from the project. Conceptually the blue oak plan should be similar to the valley oak mitigation plan. In addition, a management plan for this habitat type should be developed to assess the current condition in the project area and develop management measures to enhance and expand this habitat type. Poor recruitment appears to be a major factor affecting the decline of blue oak woodlands. The effect of current and proposed grazing practices on the health and recruitment of blue oaks should be assessed and modified if necessary. Additionally, the watershed should be evaluated in the same manner as for valley oaks to assess the historic extent of blue oak distribution and encourage restoration of historic blue oak habitat.

Analysis. CCWD has committed to avoiding blue oaks during recreation development as a part of its conceptual recreation plan. Avoidance appears feasible, given the scattered nature of blue oaks in development areas identified in the conceptual plan. If future site planning indicates that blue oaks will need to be removed, appropriate mitigation will be developed as part of that future planning process.

A loss of 20 acres of blue oak woodland, representing a loss of less than 0.5% of the blue oaks present at the project site, is expected from implementation of the project. Implementation of the project would also result in the purchase and protection of more than 4,000 acres of blue oak woodland. Habitat enhancement for the blue oak community will be accomplished by reducing grazing pressure on the entire watershed. Providing this enhancement over the entire watershed will offset the relatively small habitat loss

now determined for the project. However, Reclamation and CCWD have agreed to implement this recommendation with minor modifications as described below.

Response. Reclamation modifies this recommendation to state that CCWD will recreate approximately 20 acres of blue oak habitat to replace habitat affected by the construction of initial project facilities. CCWD will monitor the actual impacts on blue oak woodlands during the project construction. CCWD will develop and implement a mitigation plan conceptually similar to the valley oak mitigation plan based on actual impacts on blue oaks. Additionally, as part of its overall watershed management plan, CCWD will develop measures to enhance blue oak habitat. An evaluation of the historic extent of blue oak woodlands will also be conducted.

Recommendation 7.1.9

Investigate, in consultation with the Service and DFG, a range of methods to control bullfrogs within the watershed. Control of individual bullfrogs has proven ineffective.

Analysis. CCWD has committed to controlling bullfrog populations as part of its special-status reptile and amphibian mitigation plan (Jones & Stokes Associates 1992a). CCWD will continue to work with DFG and USFWS to determine appropriate control methods.

Response. Reclamation accepts this recommendation. It is consistent with the Stage 2 EIR/EIS and current mitigation plans. This recommendation will be implemented through mitigation measures 7-6 and 8-10.

Recommendation 7.1.10

Consider excluding stock ponds and wetlands from cattle grazing wherever practicable. Pipelines and troughs could be used to supply water to cattle outside of wetland areas. We suggest that Reclamation and CCWD develop a trial program at several ponds where the benefits of cattle exclusion could be evaluated; if monitoring reveals significant benefits without adverse costs to other resources, the program could be expanded to other ponds and wetlands.

Analysis. Wetland mitigation sites will be fenced to exclude or control grazing. Certain existing and created stock ponds proposed for special-status reptile and amphibian mitigation will also be fenced. Reclamation believes that reduced grazing pressures under CCWD land management will improve conditions at existing wetlands and stock ponds.

Response. Reclamation modifies this recommendation to state that designated wetland mitigation sites will be fenced to exclude or control grazing, as described in the wetland mitigation plans (Contra Costa Water District 1992, Jones & Stokes Associates 1993a). Reclamation believes that CCWD's proposed actions to exclude cattle from mitigation areas where wetlands will be created, enhance key wetland sites through fencing, and reduce grazing levels throughout the watershed will improve riparian and wetland values to offset impacts and provide net benefits. CCWD intends to evaluate grazing effects on these habitats as part of its ongoing watershed management practices with the intention of eventually eliminating grazing in sensitive habitat areas.

Recommendation 7.1.11

Allow only pedestrian and bicycle, not motor vehicle, access from Round Valley preserve to Los Vaqueros Reservoir.

Analysis. This recommendation is consistent with CCWD planning. Although access for operational use and emergency response may be provided, no public use roads are planned, except near the reservoir.

Response. Reclamation accepts this recommendation. No public access through Round Valley is contemplated.

Recommendation 7.1.12

Monitor all ponds for fish or bullfrogs. If fish or bullfrog (including polliwogs) are detected, they should be removed by a qualified biologist. Because control of individual fish or bullfrogs is rarely successful (although the removal of a rare pioneer may prevent establishment of a population), these ponds should be drained and allowed to dry out on a seasonal basis.

Analysis. CCWD has already proposed to monitor all ponds used for mitigation purposes for fish and bullfrogs and to implement control measures if fish or bullfrogs are present. Additionally, CCWD has committed to control mosquito problems through careful wetland design and management with water drawdown rather than with mosquitofish.

Response. Reclamation modifies this recommendation to state that all ponds used for mitigation will be monitored and fish and bullfrogs will be controlled. This recommendation will be implemented through mitigation measure 7-6.

Recommendation 7.1.13

Not introduce mosquitofish into any water body in the watershed, including Los Vaqueros Reservoir.

Response. See response to recommendation 7.4.8 below.

Recommendation 7.1.14

Reevaluate implementation of the proposed recreation plan. Elimination of the recreation plan would significantly reduce impacts on wildlife habitats by about 450 acres, thus reducing mitigation that would otherwise be required.

Analysis. CCWD is fully aware of the potential impacts of future recreation facilities. The mitigation program developed for the biological opinion for the San Joaquin kit fox identified methods of assessing and mitigating any future impacts. Additionally, CCWD has proposed stringent development guidelines for future recreation facilities that will, when implemented, avoid most potential impacts. CCWD will continue to work with USFWS and DFG to address any potential impacts of future recreation development (see also recommendation 7.4.7).

Response. Reclamation accepts this recommendation. CCWD will reevaluate and review its conceptual recreation plan to ensure that any potential impacts of future implementation of the plan are minimized.

Recommendation 7.1.15

Assess impacts on rock outcrops on the east and west dam abutments. If conflicts in use of rock outcrops are likely to occur, the Service and CCWD will negotiate and resolve these conflicts as appropriate.

Analysis. The rock outcrops on the east and west abutments of the proposed dam are not suitable nesting habitat for raptors, nor do they support habitat for fairy shrimp species. No conflicts or impacts are anticipated.

Response. Reclamation accepts this recommendation.

7.2 Special-Status Plant Recommendations

Recommendation 7.2.1

Control project construction activities near valley spearscale populations by placing temporary barriers around adjacent populations, providing for a 100-foot-wide buffer. Specify in construction contracts that such areas will be protected in such a manner.

Analysis. This recommendation is consistent with mitigation proposed in the Stage 2 EIR/EIS and in the draft construction mitigation plans developed by CCWD. However, because of the proximity of one spearscale population to the relocated Vasco Road alignment, maintaining a buffer of 100 feet may not be possible. CCWD believes that the planned buffer distances of less than 100 feet are adequate to protect the population and the site. This spearscale population will be monitored closely during construction. Other protection measures recommended in the FWCA report are already included as project mitigation and will be implemented.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-14.

Recommendation 7.2.2

Reestablish natural land contours, using soil salvaged from the site, on construction areas adjacent to valley spearscale populations.

Analysis. This recommendation is consistent with mitigation proposed in the Stage 2 EIR/EIS and in the draft construction mitigation plans developed by CCWD.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-2.

Recommendation 7.2.3

Reseed disturbed areas with plant species that occurred in the site prior to disturbance. Species that did not previously occur in the project area should not be introduced by mitigation revegetation.

Analysis. This recommendation is consistent with mitigation proposed in the Stage 2 EIR/EIS and in the draft construction mitigation plans developed by CCWD.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-2.

Recommendation 7.2.4

Mitigate for potential impacts on special status plant species through protection and restoration of existing special-status plant sites, at ratios greater than 1:1, rather than attempting to increase apparent population numbers at sites adjacent to disturbed sites.

Analysis. Protection and restoration of existing spearscale populations are not necessary because spearscale populations will not be adversely affected by the project. As part of project implementation, several populations of spearscale will be purchased and protected. Improved land management practices (especially decreased grazing intensity) on these lands are expected to provide some enhancement benefits for these populations.

Response. This measure is modified to specify that mitigation proposed in the Stage 2 EIR/EIS and in the wetland mitigation plan (Jones & Stokes Associates 1993a) will be implemented.

Recommendation 7.2.5

Because future livestock grazing likely will continue to adversely affect spearscale populations and their alkaline habitats, develop specific management objectives for spearscale habitat areas regarding improvements in or state of vegetative cover, composition, and vigor; in erosion and soil surface characteristics; and for hydrological functions. Use protected, undisturbed reference areas to define objectives where possible.

Analysis. This species will not be adversely affected by the project. Development of specific management objectives is consistent with the recommendation in mitigation measure 7-11 of the Stage 2 EIR/EIS. However, this mitigation measure is not required because spearscale populations will not be adversely affected by the project.

Response. This measure is rejected as not justifiable because the project will not result in detrimental impacts on spearscale populations.

Recommendation 7.2.6

Because future livestock grazing likely will continue to adversely affect spearscale populations and their alkaline habitats, closely monitor grazing use and effects. Periodically evaluate progress toward meeting specific management objectives for valley spearscale habitat areas.

Analysis. Development of specific grazing management objectives for spearscale populations is not required as a mitigation measure because the species will not be adversely affected by the project. Spearscale populations within wetland enhancement areas will be monitored to evaluate effects of protection from grazing.

Response. Reclamation modifies the recommendation to specify that CCWD should monitor population trends of spearscale in wetland mitigation areas as part of the overall mitigation monitoring program. Monitoring in mitigation sites should be quantitative.

Recommendation 7.2.7

Because future livestock grazing likely will continue to adversely affect spearscale populations and their alkaline habitats, implement other management techniques, such as changing water availability, herding, and fencing, if livestock use in these areas continues to prevent substantial improvement in vegetative, soil,

and hydrologic conditions and monitoring shows that spearscale populations and habitat continue to be degraded by livestock grazing and management objectives are not achieved.

Analysis. Implementation of intensive grazing management techniques is not required as a mitigation measure because spearscale populations will not be adversely affected by the project. Observations made during extensive field surveys in the watershed have documented that reduction in grazing intensity benefits spearscale populations (Jones & Stokes Associates 1989, 1992b). Therefore, it appears that reductions in grazing intensity that have already been implemented by CCWD will provide substantial enhancement. Because the species is sufficiently abundant in the watershed (i.e., 31 populations supporting over 60,000 individuals [Jones & Stokes Associates 1989]), more expensive enhancement techniques are not justifiable.

Response. Reclamation modifies the recommendation to state that no mitigation measures are required because spearscale will not be affected by the project. Additional, more intensive techniques to enhance spearscale and other special-status plant populations should be considered if existing measures do not maintain or enhance populations and if measures can be implemented at reasonable cost.

Recommendation 7.2.8

Avoid special-status plant populations when siting firebreaks and conducting other fire management activities. Develop future fire management plans in consultation with the Service and DFG to ensure that special-status plants are not adversely affected by fire management practices.

Analysis. This recommendation is consistent with mitigation already proposed in the project description in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-19.

Recommendation 7.2.9

Conduct preconstruction surveys at recreation development sites and avoid impacts on identified special-status populations.

Analysis. This recommendation is consistent with mitigation already proposed in the project description in the Stage 2 EIR/EIS and CCWD's Recreation Use Suitability and Opportunities Report (Jones & Stokes Associates 1991c).

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-18.

Recommendation 7.2.10

Avoid siting high-use facilities within 0.25 mile of special-status plant populations unless other features are present that protect the resource from adjacent land use and future facility expansion.

Analysis. This recommendation is consistent with mitigation already proposed in the Recreation Use Suitability and Opportunities Report and is included in the project description in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-18.

Recommendation 7.2.11

Provide design features that eliminate possible indirect effects, such as increased runoff, on special-status plant habitat areas.

Analysis. This recommendation is consistent with mitigation already proposed in the Recreation Use Suitability and Opportunities Report and is included in the project description in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-9.

Recommendation 7.2.12

All special-status plant populations should be in controlled-use or no-use areas as defined in Jones & Stokes 1991.

Analysis. This recommendation is consistent with mitigation already proposed in the Recreation Use Suitability and Opportunities Report developed by CCWD and included in the project description in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-18.

Recommendation 7.2.13

Establish a minimum buffer zone of 200 feet between special-status plant populations and new roads and trails. Design trails and roads to minimize effects of increased runoff and erosion on downslope populations.

Analysis. This recommendation is consistent with mitigation already proposed in the Recreation Use Suitability and Opportunities Report developed by CCWD and included in the project description in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-18.

Recommendation 7.2.14

Implement measures to avoid or minimize disruption of hydrologic functions and erosion effects on valley spearscale habitat areas, including, but not limited to, re-siting trails or elevating trails and paths over these areas.

Analysis. This recommendation is consistent with mitigation already proposed in the Recreation Use Suitability and Opportunities Report developed by CCWD. Mitigation options to be considered include siting trails outside the functioning watershed of special-status plant populations or installing protective devices, such as French drains or berms, that provide protection for the species, as described in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measures 7-13 and 7-18.

Recommendation 7.2.15

Avoid activities that result in loss of oak or shrubs that provide canopy cover to *Diablo helianthella* populations.

Analysis. This recommendation is consistent with mitigation already proposed in the Recreation Use Suitability and Opportunities Report developed by CCWD and included in the project description in the Stage 2 EIR/EIS.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 7-18.

7.3 Special-Status Wildlife Recommendations

Recommendation 7.3.1

Revise the bald eagle study to include collection of mortality data on ferruginous hawks, tricolored blackbirds, mountain plovers, and other species.

Analysis. Reclamation disagrees that the existing evidence shows conclusively that the Kellogg Creek watershed is a critical wintering area for ferruginous hawks and that the inundation of approximately 750 acres of annual grassland and 750 acres of dryland-farmed areas will significantly affect this species or cause displacement of a significant number of birds. DFG's 1983 raptor study characterized raptors within a much larger study area surrounding the Los Vaqueros Project site. Thus, the Los Vaqueros site is probably typical of a much larger surrounding area. Garrison (1990) found no evidence for a decline in this species in California, and his analysis indicated that the species is widespread in the state.

DFG's peak population estimate of 20 birds for the estimated 60-square-mile region surrounding Los Vaqueros indicates that probably only one to two birds would be displaced by reservoir inundation. Because few birds would be displaced by the project, mortality due to turbine collisions would not likely increase. Mortality studies show that ferruginous hawks are killed less often relative to other raptors than expected based on their abundance (0.9% mortality versus 3.0% abundance) (Orloff et al. 1991). Finally, CCWD is acquiring approximately 13,000 acres of habitat suitable for foraging by wintering ferruginous hawks and will enhance this area for raptors by reducing grazing intensity and eliminating widespread ground squirrel poisoning. However, Reclamation and CCWD have agreed to implement this recommendation.

Response. Reclamation modifies the recommendation to specify that CCWD should collect information on mortality of ferruginous hawks and other species incidental to studies of bald eagle mortality, but CCWD does not need to modify its proposed study design.

Recommendation 7.3.2

Conduct, with the cooperation of DFG and the Service, a pilot study to investigate the usefulness of grasslands of raptor perches of various designs to ferruginous hawks.

Analysis. See response to recommendation 7.3.1 above. Although Reclamation does not believe that the Los Vaqueros Project will result in any impacts on ferruginous hawks, Reclamation and CCWD are willing to participate in such a pilot study provided that the findings of the study are not considered to be binding.

Response. Reclamation modifies this recommendation to state that CCWD will participate in a pilot study to be conducted by USFWS, DFG, or some other appropriate entity. CCWD participation will be limited to no more than $10,000.

Recommendation 7.3.3

Control cattle grazing to maintain ground squirrel populations to benefit hawks.

Analysis. This recommendation has already been adopted by the CCWD and is being implemented on CCWD-owned lands.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 8-4.

Recommendation 7.3.4

Maintain records of the amounts of CCWD diversions; provide these data as needed to agencies engaged in monitoring the status of the Bay-Delta Estuary (such as, for example, monitoring efforts established during implementation of the CVPIA or under the State's efforts to protect the Bay and Delta), including the Service.

Analysis. CCWD has already proposed to maintain diversion records as part of its operations.

Response. Reclamation accepts the recommendation. It will be implemented through mitigation measure 4-3.

Recommendation 7.3.5

Create, as an enhancement measure, a seasonal impoundment in one or more of the proposed reservoir's bays to sustain a cattail wetland during drawdowns to enhance tricolored blackbird habitat by maintaining a water barrier to mammalian predation. Creation of a shallow impoundment by construction of a low, gated, earthen or fill dike may provide an opportunity for significant enhancement at relatively low cost (both financially and in terms of water). This impoundment should be large enough to accommodate at least 50 pairs of tricolored blackbirds.

Analysis. The conclusion that the Los Vaqueros Project would result in impacts on tricolored blackbird populations is not supported by the analysis in the FWCA report or extensive fieldwork conducted over a 6-year period by CCWD. Independent research conducted statewide by Jones & Stokes Associates biologists (Beedy et al. 1991, Beedy and Hayworth 1993) also does not support the conclusion that road construction and subsequent traffic would cause impacts on tricolored blackbird colonies.

The Stage 2 EIR/EIS indicates that no impacts are expected because no breeding habitat would be affected and only a small amount of wintering habitat (which is not limiting to the species) would be affected.

Creation of an impoundment as an enhancement measure would be expensive and would reduce reservoir storage. Also, it could enhance habitat for the bullfrog and fish species that may cause detrimental impacts on special-status reptiles and amphibians.

Response. Reclamation rejects the recommendation that CCWD should construct an in-reservoir impoundment. Reclamation determines that the project will not cause a significant adverse impact on the tricolored blackbird. The recommendation is not reasonable or justifiable as an enhancement measure because its cost is not reasonable and the impoundment could lead to further impacts on special-status reptiles and amphibians.

Recommendation 7.3.6

Evaluate the benefits of converting, as an enhancement measure, a portion of the project area introduced annual grasslands to higher producing native grass species (e.g., blue wildrye and meadow barley) to improve the forage value for the tricolored blackbird.

Analysis. See response to recommendation 7.3.5 above. Although Reclamation does not believe that the Los Vaqueros Project will result in any significant adverse impacts on the tricolored blackbird, Reclamation and CCWD are willing to conduct such an evaluation.

Response. Reclamation modifies this recommendation to state that CCWD will conduct an evaluation of the benefits to the tricolored blackbird of converting a portion of the project area to native grasslands. This evaluation will consist only of literature review, expert opinion, and minor fieldwork, for a total amount not to exceed $10,000.

Recommendation 7.3.7

Include objectives for tricolored blackbirds in grassland management and monitoring.

Analysis. Reclamation believes that the land management policies being implemented by CCWD on lands it currently owns will enhance the value of the watershed area for the tricolored blackbird. Reduced grazing will increase seed and forage production for insects while maintaining the open character of the watershed lands, which is important for the tricolored blackbird.

Response. Reclamation modifies this recommendation to state that CCWD will consider tricolored blackbird habitat requirements in its land management activities.

Recommendation 7.3.8

Provide, as an enhancement measure, reasonable measures to ensure nesting and cover habitat for the tricolored blackbird in wetlands and riparian areas, where such measures are compatible with the primary purposes of the mitigation projects.

Analysis. See response to recommendation 7.3.5 above. Blackberries are used for nesting and may become established naturally at wetland mitigation sites or at certain areas on the edge of the reservoir.

Response. Reclamation accepts this recommendation. It will be implemented through mitigation measure 7-6.

Recommendation 7.3.9

Minimize erosion during the construction and relocation of Vasco Road.

Analysis. CCWD as already adopted numerous measures to minimize erosion during construction.

Response. Reclamation accepts this recommendation. It will be implemented through mitigation measure 7-9.

Recommendation 7.3.10

Establish policies to ensure that the project area's biological resources are protected from dogs. One option for providing such protection is to require that all dogs be leashed.

Analysis. As part of its overall watershed management policy, CCWD will probably require that all pets be leashed on watershed lands.

Response. Reclamation modifies the recommendation to specify that during its future recreation planning efforts, CCWD should consider effects of unleashed dogs and establish policies to ensure that important biological resources are protected. Leashing all dogs should be considered as one option to achieving protection.

Recommendation 7.3.11

Minimize pesticide use in all operations. Limit insect control measures under recreation plan to structures.

Analysis and Response. Reclamation accepts this recommendation. The recommendation has already been adopted by CCWD and is being implemented on CCWD lands. It will continue to be implemented through mitigation measure 7-18.

Recommendation 7.3.12

Maintain livestock grazing at sufficient levels on remaining mountain plover foraging areas so as to maintain vegetation in open physiognomy disclimax.

Analysis. Substantial areas that are suitable as plover foraging areas are being acquired by CCWD. CCWD intends to continue to graze lands at moderate intensity and continue existing dryland farming operations.

Response. Reclamation accepts this recommendation. It will be implemented through mitigation measure 8-3.

Recommendation 7.3.13

On lands with a slope of less than 10%, disk and harrow soil within 5 to 10 days of any plowing which creates furrows during the period from September 1 through March 15. This will maintain suitable mountain plover foraging habitat.

Analysis. Dryland farming occurs on hills, not on flat ground within watershed lands. CCWD does not anticipate any need to modify ongoing agricultural practices given the potential high cost to lessees and minimal need and value for the plover. Continued agricultural use of lands will provide approximately the same habitat value for mountain plovers as has occurred in the past.

Response. Reclamation rejects this recommendation as unjustifiable and unreasonable.

Recommendation 7.3.14

Participate in Bay-Delta wetlands restoration planning and efforts.

Analysis. The Los Vaqueros Project does not have any impact on Bay-Delta wetlands.

Response. Reclamation rejects this recommendation because it is unjustifiable.

7.4 Special-Status Reptile and Amphibian Recommendations

Recommendation 7.4.1

Develop and implement a long-term monitoring program to examine the effectiveness of the proposed reptile and amphibian mitigation measures, both separately and in the context of a total program.

Analysis. The special-status reptile and amphibian mitigation plan (currently in draft for agency review) has been prepared with advice from USFWS and DFG as a long-term mitigation and monitoring plan (Jones & Stokes Associates 1992a). Although some of the measures included in the plan have not been previously used for the particular species of concern, the plan has a reasonable probability of succeeding. Remedial measures will be implemented as needed.

Response. Reclamation accepts this recommendation with the specification that monitoring will be conducted as specified in the special-status reptile and amphibian mitigation plan.

Recommendation 7.4.2

Develop success criteria based on target species' responses (rather than relying on habitat criteria) to evaluate the effectiveness of mitigation measures.

Analysis. The intent of the Special-Status Reptile and Amphibian Mitigation Plan, as stated on page 4-4 of the plan, is to monitor species occurrence and habitat components over a 10-year period and to evaluate changes in species occurrence and population numbers in relation to habitat conditions (e.g., vegetation, hydrology, upland habitat quality, levels of human disturbance and predators). Thus, population and habitat monitoring will be used to determine whether changes in the amphibian and reptile community are related to changes in habitat quality. Remedial management measures will be implemented as needed.

Response. Reclamation accepts this recommendation. It is consistent with commitments in the Stage 2 EIR/EIS and draft mitigation plan.

Recommendation 7.4.3

Revise, with the assistance of DFG and the Service, ranking criteria for evaluating habitat quality for California red-legged frogs, California tiger salamanders, and western pond turtles. The proposed mitigation should also be revised, as appropriate, given any changes in ranking criteria for habitat quality.

Analysis. Reclamation and CCWD believe that the habitat evaluations conducted by Jones & Stokes Associates (1992a) for the reptile and amphibian species were appropriate. CCWD intends to continue to work with USFWS and DFG to refine the criteria as necessary in preparing the final reptile and amphibian mitigation plan.

Response. Reclamation modifies this recommendation to state that CCWD will continue to work with USFWS and DFG to identify appropriate bases for evaluating habitat and to develop appropriate mitigation.

Recommendation 7.4.4

Guarantee the continuation of proposed mitigation in perpetuity. Many of the mitigation measures are long-term proposals (such as the bullfrog control program). Without the commitment of Reclamation and CCWD, there is no guarantee that economic considerations would not lead to program termination.

Analysis. All of CCWD's mitigation sites will be monitored as described in the draft mitigation plan. Remedial measures will be implemented as needed. Funding for mitigation and monitoring will be committed to during certification of the Stage 2 EIR/EIS and project approval.

Response. Reclamation accepts this recommendation. It will be implemented through mitigation measures 7-6, 8-7, 8-8, and 8-10.

Recommendation 7.4.5

Develop, with DFG, the Service, and qualified research scientists, an alternative mitigation program, based on the acquisition and management of existing habitats, for implementation should the monitoring program reveal that the proposed mitigation is ineffective, because most of the proposals are experimental.

Analysis. CCWD has already acquired a substantial amount of special-status reptile and amphibian habitat through its acquisition of the Kellogg Creek watershed. CCWD concurs that much can be learned from its mitigation proposals, and information gathered during monitoring will help guide any necessary remedial actions. CCWD does not view its reptile and amphibian mitigation proposal as a "technological fix", and many of the recommendations it has adopted were suggested by state and federal agency biologists.

Response. Reclamation modifies this recommendation to specify that additional habitat acquisition is not warranted, but that CCWD should continue its efforts with USFWS and DFG to refine the special-status reptile and amphibian plan so that mitigation takes the form of an adaptive management program to ensure that monitoring results are used to refine or modify mitigation actions over time.

Recommendation 7.4.6

Reexamine, in consultation with DFG and the Service, the desirability and likely effectiveness of the proposed relocation program for frogs and turtles. There is no evidence that animals so relocated will survive.

Analysis. Although the survival rate of relocated animals cannot be predicted, CCWD believes that it is preferable to attempt relocation rather than allow the animals to be inundated during reservoir filling. Relocation of animals to newly created habitat at mitigation areas or to existing ponds that have become depopulated due to recent drought seems particularly likely to succeed.

Response. Reclamation accepts this recommendation. It will be implemented through mitigation measures 8-9 and 8-11.

Recommendation 7.4.7

Consult with DFG and the Service when planning future recreation facilities and implementation of the recreation development guidelines.

Analysis. The recreation plan described in the Stage 2 EIR/EIS and other documents is conceptual. CCWD has adopted numerous feasible guidelines to ensure that impacts on special-status species do not occur. CCWD has agreed to continue to work with USFWS and DFG to refine the recreation plan as various features are proposed.

Response. Reclamation accepts this recommendation. It will be implemented through mitigation measure 7-18.

Recommendation 7.4.8

Adopt as policy that *Gambusia* not be used for mosquito control in the Kellogg Creek watershed or other lands associated with the project. Exceptions to this policy should be made only after consultation with the Service.

Analysis. CCWD has incorporated design measures into wetland mitigation sites to reduce mosquito breeding habitat, including the ability to drawdown water levels rather than introduce mosquitofish for mosquito control. CCWD does not intend to encourage use of mosquitofish on watershed lands and does not anticipate major conflicts with day-use recreationists. CCWD will work with the local mosquito abatement district to minimize conflicts with aquatic reptile and amphibians.

Response. Reclamation modifies the recommendation to specify that CCWD will minimize use of mosquitofish on its lands.

Recommendation 7.4.9

Revise the acreage of mitigation and compensation measures to reflect changes in estimates of the amount of occupied habitat. Surveys in 1993 revealed that earlier surveys underestimated the amount of habitat used by the California tiger salamander, California red-legged frog, and western pond turtle.

Analysis. CCWD will reevaluate the amount of occupied habitat and adjust impact acreages to reflect minor changes in conclusions about species distribution that have resulted from 1993 surveys. These changes are minor because CCWD assumed in its evaluation that all suitable habitat was capable of supporting special-status amphibians and reptiles, even if the habitats were not found to be occupied during CCWD surveys.

This conservative assumption was made because CCWD recognized that its surveys were being conducted during a series of dry years and that under optimal conditions (e.g., the wetter conditions that occurred during DFG's [1983] surveys) additional areas would likely be occupied. CCWD included

consideration of patterns of occupancy by the species by assigning higher habitat values to areas that were more continuously occupied.

Response. Reclamation modifies the recommendation to specify that CCWD will use the minor adjustments to Impact acreages that resulted from surveys conducted during 1993 in its further mitigation planning. It will be implemented through mitigation measures 7-6 and 8-10.

Recommendation 7.4.10

Conduct an evaluation of the Del Valle Reservoir in Alameda County and its watershed to assess the status of the red-legged frog and identify factors allowing the species to persist in a situation that would appear to be unsuitable. DFG is aware that the species is present below the Del Valle Reservoir. This reservoir and its tributary and downstream habitats are analogous to the Kellogg Creek/Los Vaqueros Reservoir site. Although we believe the results of this study would not necessarily provide conclusive data, it may provide more information on the complicated interrelationships between reservoir projects and red-legged frog habitat.

Analysis. Reclamation and CCWD agree that such information could be valuable to CCWD's mitigation efforts.

Response. Reclamation modifies this recommendation to state that CCWD will evaluate the status of red-legged frogs in the Del Valle reservoir watershed area and identify factors that have allowed the species to persist despite apparently unsuitable conditions. CCWD's evaluation efforts will be limited to a cost not to exceed $15,000.

7.5 Special Status Fish Recommendations

Reclamation has received from USFWS a biological opinion regarding the effects of the Los Vaqueros Project on Delta smelt. The opinion indicates that the Los Vaqueros Project would not jeopardize the continued existence of the species and prescribes reasonable and prudent measures to minimize take of Delta smelt. The opinion also states that the reasonable and prudent measures are sufficient to protect longfin smelt and Sacramento splittail.

Recommendation 7.5.1

Subject reservoir fillings to the reasonable and prudent measures of the Service's biological opinion for delta smelt (1993).

Analysis. Reclamation and CCWD fully intend to operate the Los Vaqueros Project in a manner consistent with the USFWS biological opinion for Delta smelt and the National Marine Fisheries Service (NMFS) opinion on winter-run chinook salmon.

Response. Reclamation accepts this recommendation.

Recommendation 7.5.2

Keep the timing of the 30-day no filling and no release period flexible. This period should be determined with concurrence from DFG, NMFS, and the Service. The Service, NMFS, and DFG should be provided with Reclamation's monthly forecasts to determine the 30-day period.

Analysis. This recommendation is similar to the requirements of the biological opinion for Delta smelt.

Response. Reclamation modifies this recommendation to state that it will comply with term and condition (1)(b) of the biological opinion for Delta smelt. CCWD will submit to DFG, NMFS, and USFWS, per operation rule 6 as described in the biological assessment, by January 1 of each year a proposal for operating the Los Vaqueros Project. This group will notify CCWD and Reclamation, if necessary, to change the timing of the periods totaling 75 days when reservoir filling is to be avoided and the concurrent 30 days when all diversions are to be avoided. The periods shall consist of a 30-day period and a 45-day period with no reservoir filling that shall occur between January 1 through July 31, and a concurrent period of 30 days with no diversions, to a maximum of 12,500 af.

Recommendation 7.5.3

Divert water, to the greatest extent possible, at the screened Old River intake, unless real-time monitoring indicates Rock Slough intake would not entrain Delta fish species of concern. This decision will be made by the Service, NMFS, and DFG, upon review of 1 full year of monitoring performed as described below.

Analysis. This recommendation is similar to the requirements of the biological opinion for Delta smelt.

Response. Reclamation accepts this recommendation.

Recommendation 7.5.4

Conduct real-time monitoring at all CCWD intakes 12 months/year for 3 years, commencing January 1, 1994. A monitoring plan should be submitted to the Service for review within 30 days of issuance of the final FWCA report.

Analysis. This recommendation is similar to the requirements of the biological opinion for Delta smelt.

Response. Reclamation modifies this recommendation to state that Reclamation and CCWD will submit a monitoring plan for the Rock Slough intake within 90 days of issuance of the final FWCA report.

Recommendation 7.5.5

Include in this real-time monitoring plan the following:

a. Sampling locations, sampling equipment, and frequency. The Service recommends sampling for a minimum of 4 consecutive days/week, 24 hours/day.

b. All fish must be identified, counted, measured, and examined for biological data on growth, smoltification, and health.

c. A commitment to return all live fish to the water, outside the influence of the intakes.

d. Make provisions to minimize fish mortalities to the greatest extent possible. All mortalities of federally listed species shall be reported to the appropriate agency in accordance with requirements identified in biological opinions for Delta smelt and winter-run chinook salmon.

Recording of mortalities should include sampling location, sampling gear, date and time, and fork length in millimeters.

Analysis. This recommendation is similar to the requirements of the biological opinion for Delta smelt.

Response. Reclamation modifies this response to state that CCWD and Reclamation will submit a comprehensive monitoring program to USFWS for its approval. The monitoring program may involve funding of the Interagency Ecological Study Program and will specify the timing and duration of monitoring efforts.

Recommendation 7.5.6

Provide the Rock Slough intake with an adequate fish screen, as required in PL 102-575. This screen must meet the criteria of the Service, DFG, and NMFS. As a non-federal agency, it would be appropriate for CCWD to participate in cost-share for this action.

Analysis. CCWD has agreed to collaborate with Reclamation to ensure that screening the intake at Rock Slough in accordance with the CVPIA is completed by October 1998. Screening the Rock Slough intake was included as term and condition (2)a) in the biological opinion for Delta smelt.

Response. Reclamation accepts this measure.

Citations

Beedy, E. C., and A. Hayworth. 1993. Tricolored blackbird (*Agelaius tricolor*) nesting failures in the Central Valley: general trends or isolated phenomenon? Pages 33-46 in Endangered and sensitive species of the San Joaquin Valley, California: their biology, management, and conservation. D. A. Williams, S. Byrne, and T. A. Rado (eds). California Energy Commission. Sacramento, CA.

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Contra Costa Water District. 1992. Conceptual wetlands mitigation plan for the Los Vaqueros Project, February 18, 1992. Concord, CA. Technical assistance provided by Jones & Stokes Associates, Inc. (JSA 90-211.) Sacramento, CA.

Garrison, B. A. 1990. Trends in wintering abundance and distribution of ferruginous hawks in California. Transactions of the western section of the wildlife society 25:51-56.

Jones & Stokes Associates, Inc. 1989. Results of biological resource inventories and habitat evaluations in the Kellogg Creek watershed. (JSA 87-031.) Prepared for James M. Montgomery, Consulting Engineers, Walnut Creek, CA and Contra Costa Water District, Concord, CA.

_____. 1991a. A conceptual plan to mitigate impacts on valley oak habitat for the Los Vaqueros Reservoir Project. December. (JSA 90-211.) Sacramento, CA. Prepared for the Contra Costa Water District, Concord, CA.

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_____. 1991c. Recreation use suitability and opportunities report. Sacramento, CA. (JSA 90-239.) Prepared for Contra Costa Water District, Concord, CA.

_____. 1992a. Draft special-status amphibian and reptile conceptual mitigation plan for the Los Vaqueros project. (JSA 92-078.) Sacramento, CA. Prepared for the Contra Costa Water District, Concord, CA.

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_____. 1993a. Wetland mitigation plan for the Los Vaqueros project. Draft. January. (JSA 90-211.) Sacramento, CA. Prepared for Contra Costa Water District, Concord, CA.

Orloff, S., A. Flannery, and G. Ahlborn. 1991. Wind turbine effects on avian activity, habitat use, and mortality progress report 1989-1990. BioSystems Analysis, Inc. Prepared for Alameda County Planning Department, Hayward, CA, and California Energy Commission, Sacramento, CA.

U.S. Fish and Wildlife Service. 1993. Fish and Wildlife Coordination Act Report - Los Vaqueros Reservoir Project. Author's draft. Prepared for U.S. Bureau of Reclamation Mid-Pacific Region. Sacramento, CA.

Attachment 5. Letters of Comments Received on the Draft Stage 2 EIR/EIS and Responses to Those Comments

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INTRODUCTION

This attachment contains written and oral comments received on the draft Stage 2 EIR/EIS and CCWD's and Reclamation's responses to those comments. Written comments are presented first, followed by oral comments. Each comment letter is numbered and individual comments are numbered within each letter. Verbal comments by each individual are also numbered. Comments and responses are presented side by side on each page, with comments appearing on the left side of the page and the corresponding responses appearing on the right side of each page. Additions made to the body of the EIR/EIS in response to the comments are underlined to help identify where changes occurred.

Several other documents are referenced in this attachment, including the biological assessment for the Los Vaqueros Project, the detailed wetland mitigation plan, the detailed valley oak woodland mitigation plan, and Section 106 compliance materials. These documents are included as appendices or attachments to this final EIR/EIS. The biological assessment is available from CCWD on request.

LIST OF PARTIES PROVIDING WRITTEN COMMENTS

Federal and State Agencies

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U.S. Fish and Wildlife Service	1
U.S. Environmental Protection Agency	2
National Marine Fisheries Service	3
U.S. Army Corps of Engineers	4
California State Water Resources Control Board	5
California Department of Fish and Game - Region 3	6
California Department of Water Resources	7

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David Mata	PH1
Tim Donohue - Sierra Club	PH2
Tom Butterfield	PH3
Wesley Van Gilder	PH4
Wilhemena Andrade	PH5
Burt Weinstein - Bicycle Trails Council for the East Bay	PH6
Frank Lehmkuhl	PH7

LETTER NO. 1

CC. JSG
Hutton
Glines
WHB

United States Department of the Interior
FISH AND WILDLIFE SERVICE

CCN 17771
EN 13.2.9.5

911 N.E. 11th Avenue
Portland, Oregon 97232-4181

EC 92/0017

MAY 14 1992

Mr. John Gregg
Program Manager
Contra Costa Water District
P.O. Box 4121
Concord, California 94524

Dear Mr. Gregg:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Stage 2 Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Los Vaqueros Project. The proposal includes construction of a reservoir, a new supplemental Sacramento-San Joaquin Delta water intake, conveyance pipelines, pumping plants, and other facilities, as necessary, for project operation. The following comments are provided for the use and information of the Bureau of Reclamation (Bureau) and the Contra Costa Water District (Water District) for preparation of the final documents. An informational copy of this review has been provided to the U. S. Army Corps of Engineers (Corps).

General Comments

The Service understands that the preferred project alternative encompasses the development of a 100,000 acre-feet reservoir located in the Kellogg Creek watershed, a new water intake facility located at Old River #5, a 3 million gallon transfer reservoir and pumping plant, a 96-inch diameter pipeline from the Los Vaqueros Reservoir to the Contra Costa Canal, power transmission line, and the relocation of Vasco Road. The preferred alternative as well as the environmental preferred alternative should be clearly identified in the final EIR/EIS.

The Service initially commented on the Notice of Preparation (NOP) for the proposed EIR/EIS on May 2, 1990. We also provided further comments on Public Notice 9000070, issued by the Corps on September 18, 1990. The Service provided a species list to the Water District on May 7, 1991, identifying those species which the Service felt would be potentially affected by the project. The Service has coordinated with the Water District representatives regularly during the past 2 years.

Because the Service believes that the proposed project may affect valuable wetlands and the operations of the Central Valley Water Project (CVP) and the State Water Project (SWP) would result in direct and indirect impacts to the delta ecosystem (Delta), the Service recommended against the Corps' issuance of a Section 404 permit for the Los Vaqueros Project (letter dated September 18, 1992). We have also repeatedly indicated to the Water District that there would likely be significant impacts on the federally listed San Joaquin kit fox and on various Delta fish species, including the proposed-for-listing delta smelt (*Hypomesus transpacificus*).

RECEIVED
MAY 15 1992

Mr. John Gregg

The project would require a section 404 permit from the Corps for discharging fill into jurisdictional wetlands and navigable "Waters of the United States". The development of the proposed project would impact approximately 18 acres, classified as "Waters of the United States". They include 1.3 acres of alkali meadows, 11.6 acres of alkali marshes, 0.001 acre of northern claypan vernal pool, 3.3 acres of willow-cottonwood riparian woodlands, and 1.9 acres of drainages. To offset the loss of wetlands acreage and values, a conceptual mitigation plan has been developed. While this plan has not been included in the draft EIR/EIS, the Service recommends that the mitigation and monitoring plan and legal commitments to them be included by appendix in the final EIR/EIS. 1-1

The proposed project would have significant effects on federally listed, endangered, threatened, proposed, and candidate plant and animal species. They include but are not limited to the San Joaquin kit fox (*Vulpes macrotis mutica*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), loggerhead shrike (*Lanius ludovicianus*), longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool fairy shrimp (*Branchinecta lynchi*), western spadefoot toad (*Scaphiopus hammondi*), California red-legged frog (*Rana aurora draytoni*), California tiger salamander (*Ambystoma tiginum californianse*), western pond turtle (*Clemmys marmorata*), winter-run chinook salmon (*Oncorhynchus tshawytscha*), and delta smelt (*Hypomesus transpacificus*). 1-2

The Service generally agrees that this project would meet the primary objective of improving water quality. However, the Service finds that this project would not meet many secondary objectives, which include maintaining and enhancing fish and wildlife resources, providing an environmentally acceptable project, and providing for fisheries benefits in the Delta. 1-3

Results of the Los Vaqueros biological inventories and other studies in eastern Contra Costa County indicate that the entire project site is within the range of the endangered San Joaquin kit fox. The permanent and temporary losses of habitat for the San Joaquin kit fox resulting from this project have not been adequately quantified because: 1) only areas which are within 2 miles of kit fox sign are considered occupied habitat; 2) some habitats which are considered unsuitable are used by kit foxes; and 3) impacts associated with the Los Vaqueros Pipeline and Recreational facilities are not quantified. The Service recommends that complete quantification of kit fox habitat permanently and temporarily affected by the project and corrections of the identified omissions would be provided in the final EIR/EIS. 1-4

The potential for the project to fragment kit fox habitat needs to be addressed. Round Valley and adjacent lands that support kit foxes may be isolated from the remainder of the kit fox population by the implementation of this project. Measures to avoid, minimize, and compensate for this effect should be identified. 1-5

The draft EIR/EIS assumes that the Los Vaqueros project is a relatively minor project, when compared to the existing operations of the CVP and SWP and that it does not contribute significantly to the cumulative effects that water 1-6

exportation from the Delta has on Delta fisheries. While the percentage of cumulative effects that the Water District has on the Delta may be small, these effects are significant given the current extent of water withdrawals and exports.

The Service finds that the analysis of the number of delta smelt and other delta fish species which may be impacted by the project has not been derived from quantitative estimates or data but, rather, from simulated models which may or may not be accurate. The Water District needs to provide accurate baseline data of fish entrainment at their existing facilities. The actual entrainment data from the Tracy Pumping Plant should be used to estimate the amount of entrainment that could be expected at the Old River #5 location. The Service finds that the draft EIR/EIS has not adequately addressed impacts on the aquatic resources of the Delta, and recommends that baseline data should be based upon existing water deliveries and not upon contracted amount. 1-7

The Water District has applied for water rights permits for a total of 298,000 acre-feet per year of water which would be diverted at various locations and pumped at a rate of 250 cubic feet per second (cfs) at Old River #5 and 350 cfs at Rock Slough. Neither the total amount of water to be diverted, nor these pumping rates have been addressed in the draft EIR/EIS. The final EIR/EIS should provide the amount and pumping rates of water, and explain the difference between the amount of water identified in the draft EIR/EIS (195,000 acre-feet per year) and the amount of water applied for by the Water District. In the final EIR/EIS, the Water District needs to provide the maximum pumping capacities for the existing Rock Slough, the proposed Old River pumping facilities in cfs, and analysis of the impacts based upon these amounts. 1-8

Specific Comments

Page 1-7, Table 1-1: The draft EIR/EIS states that Water District water demands for the planning area at full buildout would be 205,800 acre-feet per year. This amount is in excess of the 195,000 acre-feet per year water contract that the Water District has with the Bureau. The Water District estimates that, through conservation and reclamation, water demands would be approximately 188,000 acre-feet per year. Would this water demand be inclusive of the water needed to fill and operate the Los Vaqueros reservoir, or would additional "unappropriated" water be required to fill and maintain water levels as stated on pages 1-12, 2-5, 3-25, and 4-26? Without a clear statement on how much water the Water District would divert from the Delta, it is impossible to quantitatively determine the effects of the project on Delta fish species. 1-9

Page 3-6: The draft EIR/EIS uses the DWRSIM operations model developed by the DWR to simulate flows and water budgets. This model is based upon flows and demands occurring between 1922 and 1978, corrected by simulated flow and demand data through 1990. Due to the potential impacts occurring in the Delta, the Service requests that the final EIR/EIS base its analysis of Delta impacts on actual flow and water demand data through at least 1990. 1-10

Page 3-32. The DWRSIM model suggests that an increase in reverse flows within the lower San Joaquin River is likely to occur as a result of the project. The final EIR/EIS needs to quantify the number of reverse flows, timing, and rates of flow associated with these events, based upon actual flow and water demand data, through at least 1990. Impacts to fisheries resources and to SWP and CVP project operations from these flows should be addressed in the final EIR/EIS. 1-11

Pages 4-14, 4-16: Entrainment of all fish species needs to be quantified and baseline data provided in the final EIR/EIS. Without accurate baseline data, it is impossible to determine the significance of the Water District's current or future project impacts. 1-12

Page 4-17, Figure 4-6: The scale of these charts should be the same. It is difficult to interpret the data as presented here, and in a number of other charts and graphs throughout the document. 1-13

Page 4-24: The document states that since the portion of water diverted by the Water District is small compared to water diverted by the SWP and CVP, the Water District's impacts on Delta fisheries is less than significant. Without quantitative data on fish entrainment, this statement cannot be substantiated. The proposed action would have an incremental cumulative effect on the total take of delta smelt by water projects. If the delta smelt become federally listed, the Service would likely find that the Los Vaqueros project "may affect" the species. Therefore, the Water District should identify and quantify the project's take of delta smelt, and present such estimates in the final EIR/EIS. 1-14

Page 4-26: The environmental document concludes that the delta smelt is not being significantly affected by existing operations without adequate substantiation. On October 3, 1991, a proposed rule was published in the Federal Register (56 FR 50075) to list the delta smelt as a threatened species subject to protection under the mandates of the Federal Endangered Species Act of 1973, as amended (Act). This species, one of the Sacramento-San Joaquin Delta's most abundant native fish in the early 1970's, has experienced a 10-fold decline since that time. This, in part, has been attributed to extended drought periods, coupled with reductions of freshwater inflow to the Delta, and altered timing and/or duration of water exports. Variations in population levels are not unusual in fish having a limited life span or in habitats subject to cyclic perturbations. However, the delta smelt has shown no apparent recovery over the past 10 years. The effects of the current drought on the delta smelt, coupled with on-going water exports, likely would extend into future wet years and possibly beyond. Even though precipitation rates may increase, upstream reservoirs would need to be filled. Therefore, outflow conditions needed to recover the delta smelt would not likely substantially improve in the immediate future under without-project conditions. If pumping with the project is expected to increase over current baseline during wet years, rationale should be provided in the final EIR/EIS why reductions in outflow, resulting from this increased pumping, would not result in significant impacts to the delta smelt when its continued existence is, in part, hinged to improved habitat conditions during high outflow years. 1-15

Given the delta smelt's failure to recover under existing operating conditions, the environmental document needs to include a thorough analysis to support its conclusion that current withdrawals for Contra Costa County operating, together with other Delta exports, are not significantly affecting this species. What evidence is available to support this conclusion, given the continuing downward trends in the delta smelt population? Why are the impacts immeasurable? Is this because existing baseline data is not sufficient and/or there is no methodology to measure the impacts? The final EIR/EIS also needs to explain why project changes to a timing of water withdrawal during the period when outflow is crucial to delta smelt reproduction, and why an increase in water withdrawal would not result in a significant impact to the delta smelt.

Page 4-52: The environmental document suggests a "peripheral-type" canal to redirect Sacramento River flows to the export pumps. While this may reduce the effects of entrainment, it also would further reduce habitat quantity and quality needed to maintain the ecosystem that supports the delta smelt and other native Delta fisheries. The impacts of mitigation measures must be fully assessed to ensure that their implementation would achieve full protection of the delta smelt and not just trade one impact for another. Accordingly, the final EIR/EIS also needs to adequately address how proposed mitigation would lessen impacts to the delta smelt's ecosystem during its different life stages. 1-16

Page 4-54: Other than possibly providing funding for increased fish production, the Water District has not provided any mitigation for Delta fish species. While increased funding may help the fall-run salmon, steelhead, and striped bass, the Two-Party agreement currently provides no benefit to winter-run salmon or other fish species. The Water District needs to develop mitigation measures that would ensure that its project would not impact Delta fish species or conclude that the project would have a significant unmitigatable impact on Delta fisheries. 1-17

Pages 7-11, 7-43: As stated in the draft EIR/EIS, attempts to establish new, self-sustaining populations of special status plants in the wild, generally have not been successful, or have not even been attempted for most of the species that may be impacted by the Los Vaqueros Project. Although mitigation may be carried out, the Service projects that expected loss of special status plant populations would not be successfully mitigated to less than significant levels, as stated in Table S-1, pages S-11 through S-15. Thus, we recommend that Table S-1 should be modified to clearly state in the final EIR/EIS that since such mitigation is highly experimental, significant impacts from the loss of at least some special status plant populations and certain natural communities may be likely. 1-18

Page 7-37, 7-38: Mitigation objectives should specifically include a factor that addresses temporal loss of habitat from the standpoint of how long a mitigation area would take to replace wildlife values or habitat lost to the project. Replacement of values for some lost habitats would take many years longer than periods for which mitigation monitoring would be conducted. The evaluation factors (plant richness, habitat diversity, vegetative cover, surface water, social value) would have to be well defined for baseline 1-19

conditions. Application of the surface water factor would appear difficult, as defined, and should be redefined from a more functional standpoint, i.e., ability of a specific kind of habitat (seasonal wetland, for example) to a pond for a sufficient duration to provide habitat for resident wildlife (including invertebrate) species.

Page 7-38: Success criteria should be based on achieving specified similarity to high quality habitat sites, specifically species composition and diversity, particularly native species, in addition to total vegetative cover. Total vegetative cover is inadequate by itself as a valid measure of success of either habitat creation, restoration, or enhancement. 1-

Monitoring of mitigation sites should be for a minimum of 10 years, to assure that the created systems are functioning and sustaining themselves without human intervention. This requirement is to ensure compliance with performance standards, particularly in light of the fact that many of the mitigation methods being employed are highly experimental.

Tables 8-2 and 8-3: These tables list the numerous candidate species that could be adversely affected by the impacts described in the draft EIR/EIS. Although candidate species are not protected, the 1988 amendments to the Act require the Service to monitor their status. If any of these candidate species decline precipitously, they could be listed under an emergency basis. In addition, under the terms of a settlement agreement for a lawsuit brought by an environmental group, the Service will be issuing proposed rules in the near future to list a number of category-1 candidate plant species, including some or all of those in the project area.

The loggerhead shrike and the western spadefoot toad are two candidate species recorded from this region of California, but were not discussed in the draft EIR/EIS. We recommend that adequate surveys be conducted for these animals and the Service be contacted if either are found to be present in the proposed project area. Details on the impacts and mitigations for the adverse impacts should be provided to the Service. 1-

The draft EIR/EIS does not contain details on the effects of the proposed project on the candidate Alameda striped whipsnake (*Masticophis lateralis euryxanthus*). The Service recommends that the issues regarding adverse impacts and mitigations for this species be fully resolved to the satisfaction of the Service in the final environmental documents.

Pages 8-16, 8-17, 8-20, 8-23, 8-42, 8-32, 8-34: Only areas within 2 miles of a kit fox scat or sighting were considered kit fox habitat for the assessment of permanent and temporary losses of habitat. We did not recommend this analysis technique, contrary to statements made in the draft EIR/EIS, and may have resulted in exclusion of suitable kit fox habitat from consideration. Sightings and sign of kit foxes were found in the inundation zone, and east and west of the proposed reservoir. Suitable habitat is continuous in this region and kit foxes likely occupy different areas at different times. Therefore, the entire area should be considered kit fox habitat, where habitat requisites for kit fox exist. 1-

Mr. John Gregg

Page 8-16, 8-20, 8-23: Some habitats are assessed unsuitable for kit fox, yet they have been shown to be occupied by kit foxes (i.e. wetlands and some agricultural lands). Grasslands, seasonal wetlands, oak woodlands with low densities of trees, and some agricultural lands should all be considered kit fox habitat in this region, because habitat requisites for kit fox are provided on site. 1-23

Page 8-18, Page 8-20: Construction of the 12-mile-long Los Vaqueros Pipeline and construction and operation of the recreation facilities would likely result in temporary and permanent loss of kit fox habitat. These habitat losses should be quantified and mitigation measures provided for these effects. 1-24

Page 8-20 through 8-22: The realignment of Vasco Road would significantly affect kit foxes, because the road would introduce high speed traffic in an area that is otherwise unaffected. The adverse effects associated with this relocation extend beyond the road right-of-way. Effects of the road relocation include direct habitat loss resulting from road construction, habitat fragmentation and increased kit fox mortalities resulting from placement of the new, heavily traveled road in a area previously without roads, and a reduction in habitat quality for kit fox foraging and denning for some distance from the new roadway. A more complete analysis of these effects and mitigation measures should be provided. If this project is pursued, we recommend that the lands in the Herdlyn watershed area, where a kit fox natal den was observed, be purchased to compensate for habitat losses due to the relocation of Vasco Road. 1-25

Page 8-19, 8-20: Raptors are commonly killed by wind turbines in the project area. An extensive wind turbine development is adjacent to the proposed reservoir site. The endangered bald eagle and other water-related raptors are likely to be attracted to the reservoir site resulting in increased mortality in the adjacent wind turbines. Contra Costa County and the California Energy Commission are currently studying potential solutions to the raptor mortalities at wind turbines. We recommend that wind energy development rights be purchased on reservoir lands and wind turbines removed within 2 miles of the reservoir, to avoid mortality of bald eagles that will be attracted to the reservoir. We also recommend that the Water District would participate in continuing studies to find methods of avoiding raptor mortalities caused by wind turbines. 1-26

Page 8-43: All burrowing owl nests should be avoided during and after construction with adequate buffer zones. The Service recommends against utilization of blocking of burrow entrances or the unproven technology of excavating burrowing owl nests. Furthermore, the proposed excavation mitigation includes no discussion of what would be done with the birds and/or eggs. We recommend that the burrowing owl issue be fully resolved to the satisfaction of the Service in order to avoid potential violations of the Migratory Bird Treaty Act. 1-27

Page 8-45: The California tiger salamander is documented to inhabit the project area. The last remaining stronghold of the species occurs in the western portion of its distribution along the inner coast ranges. Much of the 1-28

habitat losses have been caused by agricultural conversion, urban development, and other natural and anthropogenic factors. The Service has been petitioned to list this animal as an endangered species under the Act. We anticipate issuing a 90-day finding in the near future. Mitigation for the California tiger salamander must take into account the different biological and ecological requirements of the aquatic early life stages and the largely terrestrial adults. Failure to adequately consider all life history requirements may lead to elimination or reduction of the animals. Construction of artificial habitat for the larvae alone may not provide adequate mitigation, if the impacts to the adults are not adequately mitigated. Specific plans should be developed to eliminate bullfrogs and exotic fishes from water bodies that are habitat for the salamanders. Details should be provided regarding the impact and mitigation for the reduction or loss of ground squirrels, whose burrows are utilized by adult salamanders. Further information should be provided regarding impacts caused by the proposed project to California tiger salamander movement corridors. We recommend that the final environmental documents address the mitigation that will be utilized to protect and manage California tiger salamander habitat.

The California red-legged frog and the western pond turtle could be adversely affected by the impacts caused by the proposed project. The Service has been petitioned to list these two candidate animals as endangered or threatened species under the Act. We are currently reviewing the status of these animals and anticipate issuing a 90-day finding in the near future. The Service recommends that adverse impacts to locations containing these species be fully avoided. We caution that relocation of these animals may not be an acceptable mitigation, if they are listed under the Act. Specific plans should be developed to eliminate bullfrogs and exotic fish from water bodies that contain habitat for the western pond turtle and red-legged frog. We also recommend that the methods that will be utilized to protect and manage the western pond turtle and California red-legged frog be resolved in the final environmental documents. 1-29

The California linderiella, vernal pool fairy shrimp, and the longhorn fairy shrimp inhabit the project area. The Service has been petitioned to list these animals as endangered species under the Act. We have issued a 90-day finding that substantial information exists indicating the petitioned actions may be warranted. A 12-month finding is expected to be issued in the near future. Although the draft EIR/EIS states that vernal pools inhabited by these imperiled animals would be avoided by direct or indirect (i.e. dust, runoff) impacts, increased access by humans and non-native animals could adversely affect these species. The mitigation measures described in the draft EIR/EIS for potential impacts to these animals are inadequate. The Service recommends that the issues regarding adverse impacts and mitigations for these species be resolved in the final environmental documents. 1-30

Impacts to red-legged frog, California tiger salamander, and western pond turtle are difficult to mitigate because habitat enhancement has not been successfully demonstrated for these species. Statements made on page 8-45, indicating that habitat would be fully compensated for these species, are overly optimistic. These amphibian species have been petitioned for listing as endangered; therefore, the adequacy of mitigation measures may become a 1-31

significant issue. We recommend pilot studies to establish effectiveness of mitigation measures proposed.

Page B-285 (Technical Report): The use of the Kjelson model, which was developed for fall-run salmon and used to evaluate the effect of alternative operations on salmon mortality during April, May, and June, may not be valid for other salmon runs and time periods. The Water District needs to provide data proving that the model is valid for time periods outside of the original model's assumptions. 1-32

Page B-287 (Technical Report): The entrainment data for the draft EIR/EIS has been based on data collected between 1981 and 1988; analysis should include data collected through the spring of 1992. Substantial data from the spring 1992 winter-run indicates that entrainment losses from salmon originating in the Sacramento river may be much higher than previously believed. 1-33

Summary Comments

The Service recommends that a revised or supplemental draft EIR/EIS be prepared which includes the final mitigation plan, revised quantitative fisheries data, and complete disclosure of all water rights activities and proposed operations, including the use of "unappropriated" or "surplus" water. The project's preferred alternative would have significant adverse impacts on wildlife and fisheries, the proposed mitigation would not compensate for the loss of fish, wildlife, or habitat values, and will contribute to significant cumulative impacts to winter-run salmon and delta smelt. The environmental document contains inadequate information to support its conclusion that the continued existence of the delta smelt is not jeopardized under current or future operations without or with the proposed action. 1-34

Because the proposed project would have significant adverse impacts on wildlife and habitat values, we continue to recommend against permit issuance and certification of the draft EIR/EIS. Should this project be pursued, we also recommend that the Bureau initiate formal consultation on the endangered San Joaquin kit fox and formal conferencing on the delta smelt, proposed for listing as a threatened species. We recommend that formal conferencing on the delta smelt be delayed until environmental baseline conditions are established as part of the on-going consultation on the CVP operating criteria and planning. 1-35

We have appreciated the opportunity to comment.

Sincerely,

WILLIAM E. MARTIN

Acting Regional Director

1-1. The wetland mitigation plan is incorporated as a separately bound appendix to the final Stage 2 EIR/EIS. A plan to comply with the mitigation monitoring and reporting requirements of CEQA will also be adopted by CCWD as required by state law. Legal commitments to mitigation can be made only as part of approving the proposed action. Such legal commitments will be made in the findings of fact adopted by CCWD in compliance with CEQA and the record of decision approved by Reclamation. CCWD and Reclamation also anticipate that various permits required to proceed with the project, such as the Section 404 permit, will contain conditions requiring implementation of the proposed mitigation measures.

1-2. USFWS has issued a biological opinion finding that the project would not jeopardize the continued existence of the San Joaquin kit fox or bald eagle, and has prescribed reasonable and prudent measures to minimize take of these species. The American peregrine falcon and western spadefoot toad do not occur in the project area. Loggerhead shrike are very common in the project area and the Los Vaqueros Project would have only minor effects on habitat for this species. The longhorn fairy shrimp and vernal pool fairy shrimp are rare and do occur in the project area, but the Los Vaqueros Project would have no impacts on these species and would result in substantial habitat protection.

Because of CCWD's mitigation commitments, impacts on the remaining species are also less than significant as described in the Stage 2 EIR/EIS and the biological assessment submitted to USFWS.

1-3. CCWD recognizes that the proposed action would have significant impacts on some fish and wildlife resources and has therefore proposed water facility operations and mitigation measures to reduce these impacts to less-than-significant levels wherever practicable. CCWD also believes that the proposed action, which includes the protection and improved management of nearly 20,000 acres of contiguous habitat area, will benefit wildlife resources.

The proposed action will increase CCWD's operational flexibility, and CCWD and Reclamation have worked closely with USFWS, DFG, and NMFS to develop project operations that minimize impacts on Delta fisheries and provide net environmental benefits.

1-4. The biological assessment for terrestrial species, sent to USFWS June 1, 1992, along with additional information developed during formal consultation, quantifies kit fox habitat permanently and temporarily affected by the project for all project components, including recreational facilities and the Los Vaqueros pipeline (referred to as the water pipeline). After several discussions with USFWS and DFG after publication of the draft Stage 2 EIR/EIS and before preparation of the biological assessment, it was agreed that the entire project site is within the range of the San Joaquin kit fox and all suitable habitat is considered occupied. Suitable habitat was agreed to include all grasslands, valley oak savanna, and dryland farmed lands.

1-5. Comment noted. CCWD and Reclamation have analyzed the potential effects of habitat fragmentation on kit fox that could result from project facilities, including the Los Vaqueros Reservoir and relocated Vasco Road. This analysis, with mitigation and compensation measures, was included in the biological assessment that was sent by Reclamation to USFWS. CCWD has also identified recreation facilities that have been eliminated to reduce impacts and further minimize the potential for fragmentation, as described in USFWS's biological opinion.

1-6. The draft Stage 2 EIR/EIS does, in fact, identify numerous impacts on Delta fisheries as contributing in a minor way to significant cumulative impacts (see pages 4-25 and 4-26 for examples). CCWD and Reclamation recognize and state in Chapter 4 of the Stage 2 EIR/EIS, "Delta System Fisheries" that, while project-related diversions are small compared to total Delta diversions, CCWD's incremental additions to the cumulative impact of all Delta diversions are significant. The Los Vaqueros Project itself, however, will not result in increases in Delta diversions, except for initial filling of the reservoir and a small amount to offset evaporation from the reservoir.

1-7. The effects of alternative operations were evaluated relative to existing conditions, which includes existing levels of water deliveries to CCWD. The analysis also evaluated the effects of alternative operations under future demand conditions. Future operations (for all alternatives including the No-Action Alternative) were then compared to the existing (baseline) condition.

Baseline fish entrainment data are not available for the existing CCWD intake on Rock Slough. Data on fish entrained in the Contra Costa Canal have been collected sporadically, but the data have not been collected in a manner that allows estimation of entrainment rates. CCWD will be monitoring fish entrainment at its intakes for the Los Vaqueros Project.

The use of historic salvage data for the CVP pumps (Tracy) to estimate the amount of entrainment that could be expected at the Old River No. 5 location is questionable. The CVP pumps appear to export proportionally more San Joaquin River water than the SWP pumps. The SWP pumps export proportionally more Sacramento River water, which travels via Old and Middle Rivers. Entrainment at the SWP pumps (into Clifton Court Forebay) is more representative than entrainment at the CVP pumps for estimating entrainment that would occur at an Old River or Rock Slough intake. Where feasible, historic SWP salvage data were used to calibrate the entrainment models.

Entrainment at the SWP and CVP intakes is a small part of the total mortality attributable to water project operations in the Delta. Using historic salvage data to estimate impacts ignores changes to Delta flow patterns and other physical conditions and focuses on the volume of export. Historic entrainment (salvage) data provide a reasonable estimate of temporal distribution, but many other factors must be considered when evaluating numbers of fish lost per volume pumped. These factors include annual variation in fish numbers, fish behavior and life history, and Delta water transport patterns.

The impact assessment models used in the draft Stage 2 EIR/EIS were developed to evaluate the effects of changes in transport patterns and the effects of increased diversion. The historic salvage provided a base for estimating temporal distribution and a base level of entrainment under known conditions. The models provide not only an estimate of entrainment loss, but also an estimate of changes in entrainment under variable Delta transport conditions, including closure of the Delta Cross Channel gates, reverse flow in the lower San Joaquin River, and variable inflow sources. The models also allow consideration of salinity and the associated distribution of some species.

The models provide valuable information when used to compare alternative operations. The models incorporate available information on species life history, effects of Delta transport patterns, and historic entrainment. Use of entrainment data alone would also not be accurate in a predictive sense and would not incorporate available information. The best available tools were used to evaluate the impacts of the alternative operations. Additionally, the biological opinion for Delta smelt bases its analysis in part on the impact analysis from the impact assessment models.

1-8. CCWD has two water right applications pending before the California State Water Resources Control Board for the Los Vaqueros Project. Application 20245 is for diversion into storage of up to 163,000 af/yr at the Los Vaqueros Reservoir site or, alternatively, up to 135,000 af/yr at the Kellogg Reservoir site. Application 25516 is a partial assignment of a state filing for diversion from Kellogg Creek. Application 25516 includes a storage component of 10,800 af/yr at the Los Vaqueros Reservoir site, and 14,800 af/yr at the Kellogg Reservoir site. In addition, application 25516 includes a small direct diversion component from Kellogg Creek.

Although CCWD had determined which alternatives would be addressed in its EIR/EIS for the Los Vaqueros Project, CCWD filed these water right applications with the California State Water Resources Control Board before completing its extensive alternatives analysis and the draft Stage 2 EIR/EIS. The water right application process provides the ability to reduce the quantities and rates of water diversion, but does not allow an application to be increased without refiling the application.

To ensure that feasible alternatives were not eliminated and to minimize potential schedule delays caused by the need to refile an application if changes in the project occurred, CCWD intentionally filed applications for larger quantities of water and greater rates of diversion than its projected need. The Stage 2 EIR/EIS, however, only analyzes, and provides environmental documentation for, alternatives consistent with CCWD's identified water quality and reliability objectives.

The water rights applications will be reduced to be consistent with the CCWD staff-preferred alternative identified in the Stage 2 EIR/EIS. Making the water rights applications consistent with CCWD's proposed action that was addressed in the Stage 2 EIR/EIS will involve reducing the quantity of water that can be diverted to storage to 100,000 af, reducing the diversion rate at the new supplemental intake from 600 cubic feet per second (cfs) to 250 cfs, and eliminating the Kellogg Reservoir site from the water rights application.

CCWD has not proposed or provided environmental documentation under either CEQA or NEPA to construct or operate a project other than those considered in the Stage 2 EIR/EIS. In addition, CCWD's draft amended water service contract with Reclamation specifically states that "in utilizing its CVP water supply in conjunction with its Los Vaqueros water rights water, the District shall not deliver within its existing service area, in any one year, a quantity of water in excess of 195,000 acre-feet."

Therefore, the total amount of water available for use within CCWD's service area under both Los Vaqueros water rights and through CCWD's contract with Reclamation is 195,000 af.

1-9. The quantity of water diverted to the Los Vaqueros Reservoir would vary annually depending on numerous factors, including the amount of storage in the reservoir at the beginning of each water year and the availability of flows in the Delta when water quality met CCWD's diversion-to-storage water quality criterion. Detailed information regarding CCWD's diversions from the Delta under each alternative is contained in Appendix B of the Stage 2 EIR/EIS Technical Report (pages B-8 through B-86). Attachment 2 to the final EIR/EIS contains detailed information regarding CCWD's diversions from the Delta under the revised operations rules for the Los Vaqueros Reservoir Alternative. The biological opinions for fish species also contains detailed information regarding CCWD's operation of the Los Vaqueros Project with the incorporation of mitigation measures to reduce impacts on Delta fisheries. Based on the 57-year simulations used to assess the effectiveness of the project alternatives and their environmental impacts, under buildout water demand and extreme conditions, CCWD's total annual Delta diversions could vary from 138,500 af to 223,000 af. However, CCWD's draft amended water service contract with Reclamation limits the amount of water delivered to the CCWD service area to 195,000 af/yr.

The net average annual change in Delta diversions resulting from the project is 3,300 af. This slight increase in diversions would occur because of evaporation from the Los Vaqueros Reservoir. This evaporation would occur in the system regardless of whether the water were stored in the Los Vaqueros Reservoir.

CCWD has also examined the project for a variety of other scenarios, including operations studies based on 70-year hydrology (1922-1991). Included were a variety of existing and potential water quality and flow standards, including D-1485, Draft D-1630, and D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). Summaries of the results of these studies are shown in Attachment 2. The studies show that, regardless of hydrologic period and water quality and flow standards, the project does not result in significant net increases in diversions; that the diversions in any one year do not deviate significantly from the average diversions; that increased diversions generally occur in wet years following dry years; and that decreased diversions are common in dry years.

1-10. The analysis is appropriate and yields sufficient information to draw valid conclusions about project impacts. The analysis is based on Central Valley hydrology from 1922 through 1978, not on actual flows and demands. The climatic sequence (e.g., precipitation and evaporation) is used as input. The water demands are estimates of existing and future conditions.

Adding current hydrology to the sequence (1979-1991) changes the sample statistics slightly but not the conclusions. This is seen in Attachment 2, which shows relevant results of the analyses using 70-year hydrology for: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). These results demonstrate that, regardless of assumptions concerning Delta standards and the length of the hydrologic record, the project has virtually no effect on Delta flows and salinity, and that the conclusions based on the earlier studies are unchanged.

Use of actual 1979-1990 export levels is not appropriate because these levels would underestimate current and future demand levels (demand levels sometimes exceed export levels). Furthermore, actual flows and export levels would not be representative of current and potential water quality and flow standards.

1-11. The analysis contained in the EIR/EIS shows that the proposed action would result in slight increases in the volume of reverse flows in the lower San Joaquin River when those reverse flows were already occurring because of CVP and SWP diversions from the southern Delta. As shown in Figure 3-20 of the Stage 2 EIR/EIS, on the average, the proposed action would result in a slight decrease in the frequency and volume of reverse flows in the months of November and August, and a slight increase in the frequency and volume of reverse flows in the months of April and July. The revised operational plan included in the biological assessment was developed as a mitigation measure for the proposed project may slightly alter the specific results described in the draft EIR/EIS but will not change the conclusions. See the "Mitigation Measures" section of Chapter 4, "Delta System Fisheries" for discussion of this issue.

The analysis for other conditions (70-year hydrology for: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon and the FWS CVP-OCAP Biological Opinion on Delta smelt) shows that the project effects on reverse flows are very small, regardless of the assumptions on hydrology and Delta standards. (see Attachment 2.)

1-12. The biological assessment for the Los Vaqueros Project, available from CCWD, contains detailed information regarding the estimated levels of fish entrainment at CCWD's existing facilities. CCWD and Reclamation believe that the impact analysis contained in the EIR/EIS is adequate to determine the significance of project-related impacts. The biological assessment for the Los Vaqueros Project, also contains additional information regarding measures proposed by CCWD to reduce impacts on Delta fish species. Also, USFWS has issued a biological opinion for Delta smelt that also addresses longfin smelt and Sacramento splittail and finds no jeopardy to the species exists.

1-13. Comment noted.

1-14. The specific impact referenced in this comment relates to the effects of the proposed action on Delta Cross Channel diversions and related effects on fish migration and survival. The discussion on page 4-24 of the EIR/EIS explains that because of specific operational rules in the model simulations on which the impact analysis is based, very small changes in calculated Delta outflow can cause changes in the simulated operation of the Delta Cross Channel. In fact, Delta outflow is not measured and the proposed action would have very minor effects on Delta Cross Channel diversions and flows in Georgiana Slough. The impact analysis on page 4-24 recognizes, however, that these minor changes in flow would contribute to significant cumulative effects on chinook salmon.

1-15. CCWD and Reclamation recognize that the Delta smelt population has declined from peak population levels that occurred in the 1970s, and CCWD is committed to operate the proposed project to minimize effects on this species. The biological assessment fully analyzes and describes the effects of the proposed project with mitigated operations on the Delta smelt. Since the date of the comment letter, USFWS has issued a biological opinion finding no jeopardy to the Delta smelt.

CCWD and Reclamation recognize that the proposed project would contribute slightly to significant cumulative impacts associated with additional diversions projected under the No-Action Alternative.

1-16. The Stage 2 EIR/EIS does not discuss a "peripheral-type" canal as a mitigation measure. The reference on this page to construction of a new Delta Cross Channel connection at a location where fish could be screened effectively is not necessarily tied to construction of a canal around the Delta. In addition, as stated in the introduction to this section of the Stage 2 EIR/EIS on page 4-51, Reclamation, the state, and CCWD are not proposing to implement the measures described to mitigate the impacts described under the No-Action Alternative. The purpose of the discussion of these mitigation measures is to clearly differentiate between those impacts and related mitigation measures that result from simulated changes in background conditions and those impacts that are a direct result of implementing the alternatives considered in the Stage 2 EIR/EIS.

1-17. As a result of comments received on the draft EIR/EIS, meetings with the various resource agencies, and a formal Section 7 consultation, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta during the winter-run chinook salmon's season of highest vulnerability. This operation will allow CCWD to eliminate all its diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species. USFWS has also identified further operational measures to minimize impacts in its biological opinion for Delta smelt.

1-18. As a result of modifications to the centerline design of the relocated Vasco Road since publication of the draft Stage 2 EIR/EIS, the road no longer affects special-status plant populations. No other project features would affect special-status plant populations.

1-19. Comment noted. Detailed mitigation plans for wetlands and oak woodlands include criteria that address the expected temporal loss of habitat values and these criteria are incorporated into the mitigation objectives. Surface water ponding in the project area is highly variable and is generally related to specific rainfall events and site-specific soil and groundwater conditions, not annual rainfall. Storm events can cause ponding even during extremely dry years and ponding may be minimal even during wet years if rainfall during specific storm events is moderate. The replacement habitats will be designed to provide the ability to pond water in a manner similar to the specific habitat areas affected.

1-20. As noted under "Success Criteria" on page 7-38, proposed success criteria indicate that success would be achieved when:

- total vegetative cover exceeds 80% of the amount of cover at the reference sites and
- dominant and characteristic species in referenced habitats comprise 80% or more of the vegetative cover and greater than 50% of the invertebrate fauna.

CCWD does not believe that many of the mitigation methods being employed are highly experimental. The proposed mitigation program specifically recognizes that the creation of some specific habitat types would be difficult and experimental and therefore proposes to mitigate for these habitats using out-of-kind creation of less complex habitat types to provide no net loss of wetland acreage and to recover lost values through a combination of enhancement, restoration, and purchase and protection of high-quality sites. These methods have been employed at pilot test sites in the Kellogg Creek watershed for the last several years and have proven highly successful. CCWD therefore believes that monitoring periods of 5-7 years are generally appropriate but has agreed to monitor mitigation sites for 10 years.

A detailed wetland mitigation plan has been prepared and is included as an appendix to the final EIR/EIS.

1-21. Comment noted. See response to comment 1-2. Loggerhead shrikes were frequently observed during field surveys and the proposed project would result in some loss of shrike foraging habitat. This impact is considered less than significant because the project will protect and provide several thousand acres of suitable foraging and nesting habitat. Suitable spadefoot habitat does not exist in the project area. In addition, no spadefoot adults or larvae were observed during surveys for special-status aquatic invertebrates and vertebrates.

CCWD has conducted detailed surveys for Alameda whipsnakes in suitable habitat in the Kellogg Creek watershed and relocated a potential quarry site to avoid impacts on this species. As indicated in the biological assessment, the proposed action would have no effect on this species.

1-22. Comment noted. See response to comment 1-4. All of the project area where kit fox habitat requisites exist is considered kit fox habitat and was addressed as such in the biological assessment.

1-23. Comment noted. Mitigation measures proposed in the biological assessment and required by the biological opinion include compensation for kit fox habitat including grasslands, valley oak woodlands, and dryland farmed land.

1-24. Comment noted. See response to comment 1-4.

1-25. Comment noted. The biological assessment includes a detailed analysis of the effects on kit fox of direct habitat loss, fragmentation, increased mortality, and reduction in adjacent habitat quality from the relocated Vasco Road. Also included are mitigation measures designed to avoid, minimize, and compensate for impacts. In addition, at the urging of DFG and USFWS, CCWD has agreed to purchase mitigation lands in the Herdlyn watershed area to compensate for habitat loss.

1-26. Comment noted. CCWD does not plan to develop, or lease lands for others to develop, wind energy conversion systems on lands for which CCWD owns the wind energy rights. However, CCWD generally does not propose to purchase wind energy rights on lands that already have leases for wind energy development in place, which include some of the lands within 2 miles of the Los Vaqueros Reservoir. The creation of a reservoir could attract bald eagles to the project area and make them vulnerable to increased mortality caused by wind energy development. The biological assessment thoroughly discusses this issue. CCWD and Reclamation believe that addressing this impact is the responsibility of wind energy producers in the project area. Wind energy producers and the California Energy Commission are actively addressing this impact. Possible measures include making the wind turbine blades more visible, installing insulating devices and modified crossarms, and revising pole configurations to reduce collisions. The biological opinion for terrestrial species identifies measures to minimize any indirect impacts on bald eagles associated with the reservoir.

1-27. Comment noted. CCWD has stated that active burrowing owl dens will be avoided during the breeding season with appropriate buffers. Possible or known burrowing owl dens will not be excavated without USFWS and DFG concurrence and recommendations on the appropriate procedures to follow if owls are present.

1-28. Comment noted. CCWD and Reclamation have fully analyzed impacts on California tiger salamanders that could result from the proposed project including the reservoir and the relocation of Vasco Road. Mitigation plans have been designed that take into account both life stages of this species. These mitigation plans have been provided to USFWS and DFG in the biological assessment for terrestrial species transmitted by Reclamation on June 1, 1992, and are being further refined.

1-29. Comment noted. CCWD and Reclamation have fully analyzed impacts of project implementation on these species. Mitigation plans for terrestrial species have been more fully developed and provided to USFWS in the biological assessment transmitted by Reclamation on June 1, 1992.

1-30. Only one population of vernal pool fairy shrimp (*Branchinecta lynchi*) could be affected by the proposed project. This population occurs in a large rock outcrop vernal pool at the eastern edge of the watershed. Potential impacts on this species are related to the relocation of the natural gas pipelines, which could result in temporarily increased access to the sites by construction workers. CCWD believes that mitigation measures proposed in the Stage 2 EIR/EIS and further expanded in the biological assessment for terrestrial species are adequate to protect this species from any potential impacts. Since the date of the comment letter, USFWS has issued a draft conference opinion finding no jeopardy to the three fairy shrimp species.

1-31. Comment noted. CCWD recognizes that these species are sensitive and has identified mitigation measures to reduce impacts on these species to less-than-significant levels. The biological assessment for terrestrial species provides additional information on impacts and mitigation

measures for these species. CCWD will be actively managing the Kellogg Creek watershed and will have substantial opportunity to address impacts on these species. CCWD will consider the need for pilot mitigation studies and will continue to consult with both DFG and USFWS regarding the need for such studies.

1-32. The Kjelson model was developed based on information for fall run during April-June. The model is the best tool available to evaluate effects of flow splits and export level on chinook salmon survival during migration through the Delta. Application of the model to other runs is probably not a significant departure from application to fall run because all chinook salmon have similar migration behavior and temperature requirements. Application outside the April-June period, however, could result in significant bias.

The main bias would be the effects of temperature and survival through the Delta via the Delta Cross Channel and Georgiana Slough. Temperatures would be less than 59°F during November-March and temperature-related mortality would probably not occur. Also, agricultural diversions are much lower during November-March than during April-June. Consequently, mortality during migration through the Delta during November-March may be overestimated by the Kjelson model. The result may be that application of the Kjelson model to November-March will result in higher estimates of mortality than would actually occur.

The model, however, indicates that mortality of chinook salmon juveniles migrating via the Delta Cross Channel and Georgiana Slough is greater at high export. Therefore, increased diversion causes increased mortality. Although the change in mortality rate resulting from increased export during November-March may be overestimated, the model is an adequate tool for comparing alternative operations that primarily affect the volume of export.

1-33. CCWD has reviewed the referenced information and determined that it does not change impact analyses or conclusions.

1-34. CCWD believes that the information contained in the Stage 2 EIR/EIS, the biological assessment for the Los Vaqueros Project, and the various mitigation plans that have been developed in conjunction with DFG, USFWS, NMFS, and the Corps provide detailed information regarding project operations and project-related impacts and benefits. The revised operations developed as mitigation for the proposed project and presented in the biological assessment for fish species (submitted to the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on August 25, 1992), combined with additional measures imposed by USFWS through consultation, substantially reduce impacts on fish species as compared to the no-project condition. See also response to comment 1-17.

1-35. Formal consultation on the endangered San Joaquin kit fox was initiated on June 1, 1992. Formal consultation on the Delta smelt was initiated on April 7, 1993. Consultation on these species was concluded in September 1993. The results of this consultation are summarized in Chapter 20, "Consultation and Coordination".

LETTER NO. 2

CCN17740
EN 13.2.9.5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

cc:
JSG
Glines
Hutton
WHB

May 11, 1992

Roger Patterson
U.S. Bureau of Reclamation
Mid-Pacific Division
MP-750
2800 Cottage Way
Sacramento, CA. 95825

Dear Mr. Patterson:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Report/Environmental Impact Statement (DEIS) for the project entitled **Stage 2, Los Vaqueros Project, Contra Costa County, California.** Our review is provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) and Section 309 of the Clean Air Act.

The Contra Costa Water District (CCWD) is proposing to improve the quality of water supplied to its customers, to minimize seasonal water quality changes and to improve the reliability of its water supply by providing water supply storage within the Kellogg Creek watershed to be used during emergencies (e.g., earthquakes, chemical spills) and for blending with low quality water from the existing Rock Slough intake. The Bureau of Reclamation (BOR) would amend Water Service Contract 1754-3401 with CCWD (the Federal action) to allow changes in CCWD diversions and to allow CCWD to modify its existing facilities in order to allow the Los Vaqueros Reservoir to operate. Alternatives considered in detail are no-action existing conditions, no-action future conditions, no-action cumulative future conditions, Los Vaqueros Reservoir, Kellogg Reservoir, Desalination/EBMUD Emergency Supply and Middle River Intake/EBMUD Emergency Supply. No-action existing conditions describe and evaluate existing water demand conditions, no-action future conditions include future increased water demand, and the no-action cumulative future conditions considers maximum water demand plus buildout of proposed facilities (e.g., the State Water Project (SWP) North and South Delta projects, Los Banos Grandes). The reservoir alternatives include the evaluation of seven alternative new intake and pipeline configurations. The preferred alternative is the Los Vaqueros Reservoir with a new supplemental intake at Old River No. 5 site.

We commend CCWD and BOR for the well organized and detailed EIS. Of special note are the clear statements of evaluation methodology, level of significance criteria and mitigation 2-1

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suggestions. We appreciate the inclusion of three no-action scenarios which allow comparisons with existing, future, and cumulative future water supply demand conditions without the project. Furthermore, we are pleased with the effort to recommend mitigation for potential impacts of the no-action future and no-action cumulative future conditions.

EPA believes it is important to develop water supply strategies which ensure the availability of water to meet protective water quality standards for the San Francisco Bay and Sacramento River and San Joaquin River Delta (Bay/Delta) and to protect aquatic resources and endangered species. It is our belief that projects predicated upon increased Delta exports should not be committed to until completion of the State Board hearings. Although this project does not propose a large increase in Delta diversions, we are concerned with the evaluation and approval of this project prior to adoption of protective water quality standards for the Bay/Delta by the State Water Resources Control Board. We therefore recommend deferring approval of this project until final adoption of protective water quality standards for the Bay/Delta unless it is clearly demonstrated that the project will not adversely affect the designated beneficial uses of the Bay/Delta estuary. 2-2

The project proposed by BOR and CCWD would allow CCWD to increase diversions from the current level of 135,000 acre feet (af)/yr (pg. 2-1) to the full BOR allocation of 195,000 af/yr (pg. 2-13) by removing physical constraints in the CCWD delivery system. The reservoir storage alternatives appear to be based on the premise that there are "surplus" flows during the winter and spring months available for export into the reservoir without impairing compliance with water quality standards or affecting beneficial uses. The shift in pumping to the winter may be environmentally sound <u>provided</u> there is no net increase in exports that may conflict with protection of the Bay/Delta ecosystem and endangered species resources. Assuming that under certain conditions there is water in excess of the flows required to meet water quality standards and protect the aquatic ecosystem during wetter months, it is important to recognize that this water may be needed to meet water quality standards in <u>other</u> seasons. The FEIS should clearly specify the criteria that will be used for diverting unregulated outflow and flood flows and evaluate how the amount of available "surplus" flows would be determined. 2-3

The evaluation of water supply potential is based on water quality standards and flows recognized in D-1485 which do not adequately protect beneficial uses in the Bay/Delta and which are being revised through the current State Board proceedings scheduled for completion at the end of 1992. Since these standards are no longer considered adequate to protect the estuary, they do not provide an appropriate baseline for determining the availability of unregulated water for storage. We believe the project and EIS should treat revision of water quality standards as "reasonably foreseeable." 2-4

Other areas of concern to EPA are potential impacts to fisheries, wetlands and air quality. Based upon our review of the DEIS, and the above concerns, we have classified this DEIS as category EC-2, Environmental Concerns - Insufficient Information (see enclosed "Summary of Rating Definitions and Follow-Up Actions"). Although this project does not propose a large increase in Delta diversions in comparison with other proposed water supply strategies which we have rated more severely, we still have strong concerns with potential impacts to fisheries and the need for a firm commitment to mitigate for these impacts. We also emphasize the need to clearly demonstrate that the project will not conflict with the availability of water to meet existing and reasonably foreseeable future protective water quality standards for the Bay/Delta and its beneficial uses. Our detailed comments are enclosed. 2-5

We appreciate the opportunity to review this DEIS. Please send three copies of the Final EIS to this office at the same time it is officially filed with our Washington, D.C. office. If you have any questions, please call Jacqueline Wyland, Chief, Office of Federal Activities, (415) 744-1584 or Laura Fujii, of her staff, at (415) 744-1579.

Sincerely,

Deanna Wieman, Director
Office of External Affairs

Enclosure: (10 pages)

Filename: LVAQDEIS.LTR
92-069
MI000323

cc: BOR, Doug Kleinsmith
FWS, Wayne White
COE, Colonel Sadoff
CCWD, Janice Hutton
CCWD, Jones & Stokes, Gary Darling
SWRCB, Ross Swenerton
RWQCB, Central Valley Region, F. Wayne Pierson
BAAQMD
ARB

SUMMARY OF RATING DEFINITIONS
AND FOLLOW-UP ACTION*

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alterna tive or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably avail able to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment.

COMMENTS

NATIONAL ENVIRONMENTAL POLICY ACT

Alternatives Analysis

A number of projects are being proposed to increase storage of "surplus" Delta flows. As stated in the DEIS, the Los Vaqueros site is capable of providing greater capacity than the proposed 100,000 af. EPA is aware of CCWD efforts to encourage participation by other agencies to achieve benefits that could be realized from a joint-participation project. We believe further evaluation of an enlarged joint-participation proposal may be beneficial and urge other agencies to consider the Los Vaqueros site as an alternative for other potentially more damaging proposals. 2-6

Cumulative Impacts

It is our understanding that the evaluated Kellogg Reservoir alternative, located downstream of the proposed project, would not be precluded by construction of Los Vaqueros Reservoir. The FEIS should address the feasibility of later development of Kellogg Reservoir. If such development is "reasonably foreseeable," the FEIS should evaluate the cumulative impacts of this future development. The FEIS should also address the potential for an expanded Los Vaqueros Reservoir versus later development of Kellogg Reservoir. 2-7

The DEIS does not appear to address the cumulative impacts of the Corps of Engineers' proposal to reoperate Folsom Reservoir for 10 years. Folsom Reservoir reoperation would increase the allocation of storage space for flood control therefore reducing firm yield water supply, hydropower, and operational flexibility to meet Bay/Delta water quality standards. The FEIS should fully evaluate the potential cumulative impacts of Folsom Reservoir reoperation taken together with this project, in accordance with 40 CFR 1502.16 and 1502.8. 2-8

WATER RESOURCES

Water Quality Comments

1. The probable availability of "surplus" Delta flows should be estimated. The proposed project could increase competition among existing and planned projects for diversion of unregulated Delta outflow. Although the DEIS examines the no-action cumulative future condition (CVP/SWP buildout and maximum water demand), the DEIS does not appear to address the feasibility for these projects to <u>simultaneously</u> divert this "surplus" without impairing compliance with current and potentially more stringent 2-9

future water quality standards. In fact, the DEIS evaluation of the no-action cumulative future condition appears to indicate significant reduction in Delta inflow and outflow and CVP/SWP reservoir storage levels even without the proposed project (pg. 3-23). Even though Los Vaqueros may cause very small incremental changes to Delta conditions in comparison with the no-action future and no-action cumulative future conditions (pg. 3-32), we remain concerned with the cumulative affect on the Bay/Delta. We believe the issue of feasibility for simultaneous diversion of "surplus" flows is critical in determining potential adverse impacts to water quality of the Bay/Delta and should be addressed in the FEIS.

2. We recognize that the likelihood of new water quality standards makes it difficult to predict changes in operations and structures of the CVP and SWP. Nevertheless, these changes will certainly occur. Two future scenario impacts are likely: (1) the greater flexibility in water diversions by CCWD as a result of implementing the preferred alternative could be beneficial to fishery resources if operation is restricted during environmentally sensitive months or (2) the increased entrainment, transport, or delay of fish within the Delta would be detrimental. 2-10

Overall, the negative impacts of this project appear minor relative to the expected degradation of the estuary if the only future change were to be the increase in total diversions as outlined under the no action future conditions scenario, which includes the projected increase in water use by CCWD. The DEIS describes a number of measures which would reduce the future degradation of the estuary and builds a case that the operation of the reservoir would be consistent with these possible changes and would, by itself, reduce some of the adverse impacts of the present system during dry and critical years. A stronger argument for environmental <u>benefits</u> can be made by using some of the capacity of Los Vaqueros to reduce the present effects of year-round operation of pumping at the current intake. A stronger case for environmental <u>protection</u> could be made by proposing to restrict pumping during sensitive periods except under some sort of emergency schedule when the reservoir is critically low. 2-11

3. The use of a future scenario which assumes the full build-out water demand of 195,000 acre-feet may be unrealistic since this demand may not be satisfied under the assumption of no project. Furthermore, enlargement of the Contra Costa Canal as an alternative way to provide for increased water demand (pgs. 18-12 to 18-14) may not be effective given the acknowledged existing difficulty of meeting acceptable water standards. We recommend the environmental cost of the project be clearly separated from the impact of projected water demands. 2-12

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4. Considerable discussion has occurred over the CCWD permit applications to pump larger quantities of water and for increased water right allocations totalling far more than the 195,000 acre-feet specified in the DEIS. The FEIS should address these issues. If pumping surplus water to fill the reservoir will reduce CCWD's need for contracted water, mitigation measures using this uncommitted water should be evaluated. 2-13

Fisheries Comments

General Comments

1. The principal concerns of project operations involve their contribution to the decline of fishery resources in the Delta and Bay. These concerns center on the displacement or entrainment of upmigrating spawners or of outmigrating young and larvae. For Delta smelt and longfin smelt the months of particular concern are from January to June; for striped bass young the months of particular concern are from April to July and from September to November; for American shad the adults are susceptible from July to August and the outmigrating young from October to December; and with four different runs, chinook salmon pass through the Delta in most months of the year both as adults and as outmigrating smolts.

Project operations would reduce CCWD pumping needs during times when water quality at the current intake is below municipal and industrial criteria (>65 mg/l chlorides and >50 mg/l sodium). Reservoir filling would occur when water of high quality is available at the new supplemental intake between the months of November and June, inclusive. Water from the reservoir would be used to extend the emergency supplies of CCWD and for blending during the summer with lower quality water from the current intake at Rock Slough. The reservoir level is expected to fluctuate from 5 to 15 feet. Because of the months of operation, the principal delta species affected will be winter-run chinook salmon, Delta and longfin smelt, and striped bass.

The proposed mitigation for increased entrainment at CVP/SWP Delta export locations (Impact 3 in Table S-1) is not appropriate for delta smelt. Closing of the cross-delta channel is more likely to be detrimental for this species in most years since gate closure would increase the strength and frequency of reversed flow in the lower San Joaquin. Furthermore, delta smelt do not pass this location. 2-14

2. The Kellogg Creek drainage fishery effects of Los Vaqueros construction and operation appear to be minor since the fish fauna is small and not composed of any species of special concern. The proposed mitigation offers ample opportunity to limit downstream construction effects. 2-15

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3. The reservoir is not expected to be emptied except in extremely rare, emergency events. The DEIS should evaluate the number of times in the historical hydrologic period that CCWD would have been able to satisfy its water supply and water quality needs without Delta diversions during the sensitive months for fisheries. Potential impacts of the project would be minimized if CCWD removed these months of sensitivity from its proposed pumping schedule, rather than offering to reduce or curtail pumping during these months as a possible mitigation measure. 2-16

4. We recommend CCWD reduce the water diversions at the existing Rock Slough intake for the Contra Costa Canal during months of environmental sensitivity (March-May) and rely more on Los Vaqueros reservoir water in years when the reservoir could be filled before March. This could provide significant environmental benefits. 2-17

5. The future conditions (other water projects and standards) in which Los Vaqueros will operate are hard to define and CCWD has made a good attempt to look at effects of future changes - the increased demand for water and buildout of CVP/SWP facilities. However, CCWD's comparison of Los Vaqueros effects with a future of increased diversions may lead to inappropriate conclusions. An example is the attribution of greater survival of salmon and striped bass in some months despite increased diversions. This arises because the emptier reservoirs could hold more spring runoff, which would lead to lower springtime river flow and less diversion at the time salmon would be outmigrating (personal communication with Greg Gartrell of CCWD). This scenario would facilitate smolt migration through the delta to some extent--but at the expense of lethally high temperatures upstream. If none of the eggs survive, efforts to reduce smolt entrainment are useless. It is particularly questionable to refer to such decreased entrainment as an occasional beneficial effect that would be most pronounced in dry years since those years would probably have the highest upstream temperatures. 2-18

6. North Delta, South Delta, and Los Banos Grandes are proposed future changes to the system which would enable withdrawal of some of the water that CCWD proposes to withdraw. How would that "competition" affect the presumed benefits of greater flexibility in water withdrawal by Los Vaqueros? 2-19

7. An "isolated facility" of some sort is a potential future condition. How will that affect getting water to the various alternative CCWD intakes? How will that amplify the impacts of water removal by CCWD on flow in the western delta? 2-20

8. New standards of salinity and temperature will be enacted in the near future and will be more restrictive than D-1485. 2-21

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Consultation with State Water Resources Control Board staff could identify problems with meeting current and future water quality standards with implementation of Los Vaqueros. A description of potential problems with attaining water quality standards for various levels of desired emergency supply and chloride/sodium reduction should be provided in the FEIS.

9. Positive net flows from January to June at Antioch seem to be one of the more likely constraints on CCWD operations. Can the effects of different intake sites be evaluated in this regard? Will the more southerly location of the alternative intake reduce the impacts of the current intake on flows in the lower San Joaquin? 2-22

10. On a broader view, future scenarios that encompass the most recent versions of the alternatives IV-VI in the State Water Quality Control Board's hearings would provide the best possible estimate of Los Vaqueros' impacts. Alternative IV (in its present configuration) would provide a likely scenario of minimal protection, and V would provide a more protective set of standards. Since these represent two identifiable and legally required sets of goals, they are reasonable standards to use to 'box' the standards that will be set, for purposes of NEPA analysis. 2-23

11. Temperature is unlikely to be controllable by project operations in some year types but is likely to be controllable in important months of other year types. How will project operations of CVP and SWP to meet temperature standards be affected by CCWD; or might CCWD's ability to take water be curtailed by federal and state agencies to meet a temperature standard? This will be difficult to address. We suggest that Sheila Green of DWR or Jack Rowell of Reclamation might be able to give some guidance on how important CCWD's role might be. 2-24

Specific Comments (DEIS pgs. S-9 to S-10)

1. The increase in suspended sediments due to construction will be mitigated by utilizing containment structures to restrict release of sediments. This appears to be adequate mitigation for what should be a minor fisheries impact. 2-25

2. The disturbance or removal of resident fish habitat at the new intake would be mitigated by avoiding or replacing riparian and aquatic vegetation. This appears to be adequate mitigation for what should be minor fisheries impact. 2-26

3. The DEIS describes increased reservoir fisheries habitat as a beneficial impact. These are generally exotic species that are doing well in many other areas thus the ecological benefit of having more of them is slight. The increased recreational 2-27

fishery opportunity is a tangible human benefit, but should not be compared to the detrimental impacts on native fisheries in the Delta. The reservoir might be of value as refuge habitat for some native species with reduced populations, particularly Sacramento splittail, blackfish, and hitch. Although the lake-dwelling subspecies in Clear Lake is extinct, it demonstrates that the fish is probably capable of survival in a reservoir like Los Vaqueros.

4. The DEIS describes reduced survival of chinook salmon and increased entrainment of all runs (including the winter-run) due to cumulative diversion impacts in some months & reduced survival of striped bass eggs and larvae and delta smelt larvae and juveniles due to reduction in net San Joaquin River outflow. Mitigation which is within the power of CCWD to perform should be required. For example, the CCWD should avoid pumping during sensitive months unless or until other mitigation conditions are made by other agencies. 2-28

Section 404 Comments

Mitigation

The section on mitigation measures (pgs. 7-36 to 7-47) adequately describes in a conceptual fashion measures that should be taken to mitigate impacts to wetlands. A detailed final mitigation plan approvable by resource agencies, EPA, and the Corps of Engineers (COE) will need to be completed before the COE can issue a Section 404 permit for the project. 2-29

AIR QUALITY COMMENTS

Planning Requirements

Contra Costa County is located in a Federal nonattainment area for ozone and is in violation of State PM10 standards. The DEIS incorrectly states that "the federal PM10 standard is not being exceeded in the Bay Area" (pg. 16-6). Violations of the federal PM10 standard have occurred in San Francisco and Santa Clara counties in the past year, and EPA will propose redesignation of these two counties to PM10 nonattainment during 1992. In addition, exceedances of the PM10 standard have been recorded at the Livermore monitoring stations. The DEIS should state that Federal agencies are required by the Clean Air Act to assure that all actions conform to an approved State Implementation Plan. In accordance with section 176(c) of the Clean Air Act (42 U.S.C. 7506),

> "No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any

activity which does not conform to an implementation plan after it has been approved or promulgated under section 110."

Conformity to an implementation plan means:

to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards; and

that such activities will not (i) cause or contribute to any new violation of any standard in any area; (ii) increase the frequency or severity of any existing violation of any standard in any area; or (iii) delay timely attainment of any standards or any required interim emission reductions or other milestones in any area. (Clean Air Act, Section 176(c)).

The Bay Area Air Quality Management District and Association of Bay Area Governments should be consulted to determine project conformity to the State Implementation Plan and Air Quality Management Plan.

The Bay Area Air Quality Management District must prepare State Implementation Plans (SIPs) for carbon monoxide (CO) and ozone which meet the requirements of the 1990 Clean Air Act. The CO SIP is due on November 15, 1992 and the ozone SIP by 1993. Furthermore, the San Francisco Bay Area will be proposed as a PM10 non-attainment area and will be required to submit a PM10 SIP 18 months after redesignation.

Air Quality Impacts

1. Growth projections should be consistent with the latest Air Quality Management Plan and State Implementation Plan. Discrepancies indicate potential nonconformity with air quality planning requirements and possible violation of Section 176 of the Clean Air Act. The DEIS states, "Water demand forecasts used by CCWD are based on city and county land use plans that are generally consistent with the forecasts used for the BAAQMD clean air plan" (p. 16-18). Since growth in different locations may have different air quality impacts, consistency with the overall Air Quality Management Plan population projections may not demonstrate full conformity. 2-30

2. The DEIS should address whether this project accommodates growth in water demand or usage. If so, the emissions from potential growth (i.e., traffic related emissions) should be quantified and their potential impact on air quality should be analyzed. In addition, the DEIS states that there will not be 2-31

significant impacts to air quality from construction under no-action future conditions even though CCWD would improve the existing water delivery system to increase capacity. Although short-term construction impacts to air quality may be minimal, the FEIS should address the issue of growth accommodated by increased system capacity and the potential impacts to air quality.

3. The quantified emissions from increased energy demand should be evaluated to determine their effect on air quality, and determine whether the latest emission forecasts in the Air Quality Management Plan account for these increases. If emissions are not accounted for in the emission forecasts, the project could have a significant impact on air quality. 2-32

Mitigation

1. The air quality analysis on pg. 14-12 concludes that ozone precursor and PM10 emissions would exceed the best available control technology (BACT) threshold values and contribute substantially to regional ozone pollution and localized fugitive dust emissions. Therefore, the FEIS should include mitigation measures for PM10 and ozone precursors and address their effectiveness to control these emissions. Although mitigation measures may not be able to reduce potential air quality impacts to less-than-significant levels (pg. 14-13), they should be presented and implemented as means to reduce and minimize these impacts. 2-33

The DEIS states that dust abatement programs would not be highly effective (pg. 14-7). On the contrary, any control measures to reduce PM10 should be included to reduce the amount of PM10 emissions. In addition to dust abatement programs, the FEIS should discuss wheel watering stations and other control strategies to prevent PM10 emissions. All mitigation measures to control dust should be included, or the FEIS should describe the rationale behind eliminating a mitigation measure.

2. On page 14-9, the cumulative effects of simultaneous construction period fugitive dust and ozone precursors are discussed. The FEIS should address the option of phasing certain stages of construction to avoid cumulative significant effects. 2-34

3. Chapter 15 discusses the project's effect on transportation systems. The FEIS should address transportation control measures to offset the adverse effects of increased vehicular trips for construction period trips and recreational trips. 2-35

GENERAL COMMENTS

1. Past actions such as land purchases within the Kellogg Creek watershed and proposed Vasco Road and utility relocation appear to commit CCWD to the Los Vaqueros or Kellogg Reservoir alternatives. The FEIS should address the actions which may occur if these alternatives are not approved or if they are drastically modified. 2-36

2. The FEIS should describe the status of coordination with the U.S. Fish and Wildlife Service pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.). We recommend the FEIS include the U.S. Fish and Wildlife Service's Coordination Act Report and Biological Opinions on endangered species. 2-37

3. Chapter 17 discusses water service expansion to the East County area. CCWD has entered into agreements with the East Contra Costa Irrigation District (ECCID) and the City of Brentwood to supply treated water to these areas (pg. 17-2). Although the DEIS states that the proposed project could only serve this expanded area if new water supply allocations are found, the FEIS should address whether the proposed project influenced and encouraged these future water service expansion agreements. 2-38

4. The FEIS should include information on the substance of public comments received in response to past Environmental Impact Reports for this project (e.g. Vasco Road and Utility Relocation EIR). 2-39

5. One of the primary goals of the proposed project is to provide a reliable emergency supply in the event of a major earthquake, levee failure, chemical spill, drought or other Delta water quality problems (pg. 1-3). The FEIS should evaluate the effect of the above events (e.g. major earthquake) on other essential components of the CCWD system. The availability of Los Vaqueros emergency supply would not increase reliability if other required conveyance and pumping facilities are also vulnerable to the same emergencies. 2-40

6. Table 8-7, pg. 8-31. The wetlands wildlife habitat value (41 acres) for the Kellogg Reservoir alternative does not match the number of wetland acres (approximately 138 acres) listed on Table 7-4, pg. 7-27. The FEIS should explain this difference. 2-41

2-1. Comment noted.

2-2. CCWD and Reclamation recognize that new water quality standards will be set in the Delta. The state is obligated to review such water quality standards every 3 years. CCWD and Reclamation believe that the EIR/EIS clearly demonstrates that the Los Vaqueros Project will have no adverse affects on the beneficial uses of the Bay/Delta estuary and that proceeding with the Los Vaqueros Project is appropriate at this time.

CCWD currently has almost no storage in its water distribution system. If a levee failure or other event occurred that rendered CCWD's Rock Slough intake unusable, CCWD could meet its demands for only several days. This emergency supply need is not related to existing or future Delta water quality standards.

As a Central Valley Project contractor and holder of state water rights, CCWD would be subject to all appropriate restrictions placed on Delta diversions as a result of state water rights proceedings and compliance with other state and federal laws and regulations. The Los Vaqueros Project would greatly increase CCWD's operational flexibility and could be a valuable addition to the Delta water system because the Los Vaqueros Project could allow CCWD to modify its operations each year to avoid or reduce impacts on sensitive Delta resources.

In order to be responsive to requests for further information and to keep up with a rapidly changing regulatory environment, CCWD has examined the project under a wide variety of current and potential water quality and flow standards. Results are summarized in Attachment 2 for 70-year (1922-1991) hydrology with: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). Included in the analysis is an assessment of some proposed EPA water quality standards. Under the operations discussed in the mitigation plan, these studies clearly demonstrate that the project will not adversely affect the designated beneficial uses of the Bay/Delta estuary.

2-3. The Los Vaqueros Project does not greatly increase CCWD's ability to divert water from the Delta. Although the Los Vaqueros Reservoir would eliminate the need to make improvements to portions of CCWD's Contra Costa Canal system, other major restrictions would still exist in the CCWD system that limit the amount of water that could be put to use. Actions necessary to remove all restrictions in the CCWD system and thereby allow CCWD to make full use of its contracted water supply would involve major improvements to the Contra Costa Canal system, which is owned by Reclamation. Compliance with all federal laws and regulations, including NEPA and the federal Endangered Species Act, would therefore be required before such improvements could be made.

The criteria that CCWD originally proposed to divert water into the Los Vaqueros Reservoir are described on pages 2-5 and 2-6 of the EIR/EIS under "Project Operations". The amount of surplus flow available is equal to the amount of water released from upstream reservoirs and floodflows in unregulated streams that enter the Delta and are in excess of the amount of water needed to meet consumptive uses, export demands, and water quality standards. Typically, when surplus flows occur, they are very large and CCWD will not need to determine precisely how much surplus flow is available to ensure that only surplus flows are diverted. See also response to comment 2-5 below.

The analyses have also included 70-year hydrology for: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run

Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). In these cases, surplus flows were those over and above the flows necessary to meet all the requirements of the standards and Biological Opinions, consumptive use in the Delta, and diversions by other projects.

2-4. As described above in response to comment 2-2, CCWD recognizes that the existing Delta water quality standards will be revised. CCWD believes that it has conducted a reasonable analysis and also believes that attempting to define possible future water quality standards is unnecessary for adequate impact assessment and would be speculative.

See also the response to comment 2-2. CCWD has conducted a wide range of studies that included numerous potential water quality standards.

2-5. As a result of comments received on the draft EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project, particularly for winter-run chinook salmon. These measures consist of revisions to the Los Vaqueros Project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta during the winter-run chinook salmon's season of highest vulnerability. This operation will allow CCWD to eliminate all its diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species.

2-6. As described in the Stage 2 EIR/EIS and Appendix B to CCWD's Section 404(b)(1) alternatives analysis, CCWD expended considerable effort to facilitate other agencies' participation in the Los Vaqueros Project since 1985. Benefits to CCWD, other participants, and the environment could perhaps be realized from a joint-participation project. CCWD has encouraged and led discussions of regional water management issues and believes that efforts to solicit participation have been extended to all potentially interested parties at the expense of delaying the planning, study, and implementation of the proposed project.

2-7. CCWD and Reclamation included the Kellogg Reservoir as an alternative in the Stage 2 EIR/EIS. Although implementing the proposed project would not physically preclude developing the Kellogg Reservoir, CCWD is unable to fund such an additional project and will be unable to do so for the foreseeable future. In addition, CCWD and Reclamation are not aware of any other entity that has plans to propose construction of a second reservoir at this location. The Kellogg Reservoir Alternative would have to overcome numerous environmental regulatory issues. The reservoir site contains many acres of wetland habitat and numerous special-status plant species populations and provides habitat for the San Joaquin kit fox. Therefore, CCWD and Reclamation do not believe that developing the Kellogg Reservoir should be considered reasonably foreseeable.

2-8. The Folsom Dam and Reservoir operations EIS was not available for analysis before the draft EIR/EIS was released. An examination of the operations studies for the proposed reoperation of Folsom Reservoir (Appendix K of the reoperation EIS) reveals that Delta outflow is likely to increase in November and December in a large percentage of years, while it is likely to decrease in February, March, April, and May.

The reoperation of Folsom Reservoir would tend to increase fall surplus flows and decrease winter and spring surplus flows. The reoperation of Folsom Reservoir would tend to reduce end-of-year storage in CVP reservoirs, thus increasing the risk of difficulty in meeting water quality standards. In addition, the operations studies show occasional drops in Delta outflow in late summer. These effects could translate into higher salinity at CCWD's intakes during some periods. This may result in a slight reduction of Los Vaqueros Project performance and an increase in salinity levels of water delivered to CCWD customers, and may have adverse impacts on municipal water supplies. However, the conclusions concerning the impacts of the Los Vaqueros Project would not change.

This would slightly increase the possibility of reservoir filling in November and December and decrease it in February through May. This would benefit Delta smelt, winter-run Chinook salmon, and other fish species.

2-9. Surplus flows are defined as flows in excess of those needed to meet water supply demands and water quality and flow requirements in the Sacramento River and San Joaquin River systems. CCWD, through water rights application 20245 filed in the early 1960s, has a higher priority to surplus Delta flows than other projects currently under review. Therefore, the proposed diversions for the Los Vaqueros Project could conceivably impinge on the ability of other future projects to divert surplus flows. It should be noted, however, that many of the projects included in the cumulative future analysis do not depend entirely on surplus flows. Many of these projects would rely on water released from upstream storage reservoirs. In addition, because surplus flow is defined as the amount of water in excess of the amount needed to meet water quality and flow standards, changes in the water quality or flow standards that increase required flows would concurrently reduce the amount of surplus water available. Therefore, the Los Vaqueros Project, along with other proposed projects, could not impair the ability to meet future water quality standards.

2-10. Comment noted. See response to comment 2-5. CCWD and Reclamation believe that the Los Vaqueros Project, with the operational mitigation measures developed as part of the biological assessment, would provide substantial benefits and significantly more flexibility to manage CCWD diversions to reduce or avoid impacts on Delta fish species.

2-11. Comment noted. See response to comment 2-5 and the biological assessment for fish species for the description of CCWD's mitigation that would restrict pumping during sensitive periods.

2-12. Comment noted. If CCWD is not allowed to meet its full water demands, impacts of the Los Vaqueros Reservoir Alternative on the Delta would be similar to those described in the Stage 2 EIR/EIS under "Existing Conditions" headings in Chapters 3, 4, and 5. CCWD and Reclamation believe that the Stage 2 EIR/EIS clearly separates the impacts of the project from effects of increased water demands. The revised operational strategy that CCWD has developed as mitigation for the proposed project indicates that impacts on some Delta resources would actually be reduced by implementing the proposed project.

2-13. CCWD has two water rights applications pending before the California State Water Resources Control Board for the Los Vaqueros Project. Application 20245 is for diversion into storage of up to 163,000 af/yr at the Los Vaqueros Reservoir site or, alternatively, up to 135,000 af/yr at the Kellogg Reservoir site. Application 25516 is a partial assignment of a state filing for diversion from Kellogg Creek. Application 25516 includes a storage component of 10,800 af/yr at the Los Vaqueros Reservoir site and 14,800 af/yr at the Kellogg Reservoir site. In addition, application 25516 includes a small direct diversion component from Kellogg Creek.

Although CCWD had determined which alternatives would be addressed in its EIR/EIS for the Los Vaqueros Project, CCWD filed these water rights applications with the California State Water Resources Control Board before completing its extensive alternatives analysis and the draft Stage

2 EIR/EIS. The water rights application process provides the ability to reduce the quantities and rates of water diversion but does not allow an application to be increased without refiling the application.

To ensure that feasible alternatives were not eliminated and to minimize potential schedule delays caused by the need to refile an application if changes in the project occurred, CCWD intentionally filed applications for larger quantities of water and greater rates of diversion than its projected need. The Stage 2 EIR/EIS, however, only analyzes and provides environmental documentation for alternatives that are consistent with CCWD's identified water quality and reliability objectives.

The water rights applications will be reduced to be consistent with CCWD's staff-preferred alternative identified in the Stage 2 EIR/EIS. Making the water rights applications consistent with CCWD's proposed action that was addressed in the Stage 2 EIR/EIS will involve reducing the quantity of water that can be diverted to storage to 100,000 af, reducing the diversion rate at the new supplemental intake from 600 cfs to 250 cfs, and eliminating the Kellogg Reservoir site from the water rights application.

CCWD has not provided adequate environmental documentation under either CEQA or NEPA to construct or operate a project other than those that are considered in the Stage 2 EIR/EIS. In addition, CCWD's draft amended water service contract with Reclamation specifically states that "In utilizing its CVP water supply in conjunction with its Los Vaqueros water rights water, the District shall not deliver within its existing service area, in any one year, a quantity of water in excess of 195,000 acre-feet".

Therefore, the total amount of water available for use within CCWD's service area under both Los Vaqueros water rights and through CCWD's contract with Reclamation is 195,000 af.

2-14. Comment noted. To reduce effects on Delta smelt, this mitigation measure would need to be combined with increased San Joaquin River inflow as described on page 4-52 of the Stage 2 EIR/EIS.

2-15. Comment noted.

2-16. See response to comment 2-5.

2-17. See response to comment 2-5. It is important to note that the normal operations of the Los Vaqueros Project would reduce diversions from Rock Slough by 50-80% during sensitive fish periods. Also, the mitigated operational scenario developed by CCWD and the resource agencies prioritizes diversions during the sensitive fish period.

2-18. Comment noted. CCWD and Reclamation recognize the complexity of the water supply system and likely effects that changes in water demands and water quality standards would have on Delta and upstream fisheries. Because of the numerous and complex factors that affect fish populations, the analysis in the Stage 2 EIR/EIS focused on changes in specific conditions at specific locations. Although CCWD and Reclamation acknowledge that, under the future conditions scenario described in the Stage 2 EIR/EIS, temperature conditions for chinook salmon upstream in the Sacramento River may be detrimental, the proposed project has virtually no effect on upstream conditions. The proposed project does, however, reduce entrainment below levels that would occur without the proposed project, regardless of the number of fish present.

2-19. The Los Vaqueros Project will rely in part on surplus flows for filling the reservoir. Some surplus flow statistics from three DWRSIM analyses are given below.

The statistics reveal that, typically, when surplus flows exist, the flows are very large. Thus, the addition of the new facilities would not significantly affect project performance.

Increased demands would tend to reduce periods of small surplus flows and increase periods of no surplus flows (compare DWRSIM analyses A7e and 543b or A7e and 476b). However, only a small difference exists between the future demand scenario and future buildout with Los Banos Grandes, Kern Water Bank and Delta channel enlargements (compare DWRSIM analyses 543b and 476b). The future case was examined in detail. It is not expected that the slight change in surplus flow availability caused by the addition of the facilities mentioned will have a large effect on Los Vaqueros Project performance, although it would certainly reduce Los Vaqueros Project flexibility and performance by a small amount.

Percent of Months with Surplus Flow
under Various Scenarios (1922-1978)

	A7e	543b	476b
No surplus	59.3	64.0	65.3
1-12 TAF/month	0.4	0.3	0.6
12-20 TAF/month	0.3	0.0	0.1
20-100 TAF/month	3.4	2.3	2.6
>100 TAF/month	36.7	33.3	31.4
Maximum (MAF/month)	11.6	11.6	11.6

Notes:
TAF = thousand acre-feet.
MAF = million acre-feet.
A7e = existing conditions.
543b = future demands, existing facilities.
476b = future buildout demands, existing facilities plus Los Banos Grandes, Kern Water Bank, North and South Delta Management Plan.
Los Vaqueros filling capacity = 12 TAF/month.

2-20. The effects of an isolated facility on Delta flows and the ability to deliver water to any of the alternate intake sites described in the Stage 2 EIR/EIS is entirely dependent on the design and location of such a facility. Because no plans for such a facility have been developed, estimating how water would be delivered to CCWD or what effects such a facility, or CCWD diversions with such a facility, could have on Delta resources would be speculative.

2-21. CCWD and Reclamation anticipate that if inconsistencies exist between operating the Los Vaqueros Project and attaining Delta water quality standards, Los Vaqueros Project or Central Valley Project operations would be limited to ensure compliance with these future water quality standards. Although limitations on Los Vaqueros Project operations may reduce the percentage of time that CCWD water quality and reliability goals are achieved as compared to that described in the Stage 2 EIR/EIS, CCWD believes that the Los Vaqueros Project will provide a benefit in terms of both water quality and reliability regardless of implementation of new Delta water quality standards.

2-22. The location of the intake would have no effect on net flows in the San Joaquin River near Antioch, nor on the calculation of QWEST. The current and proposed intakes are both in the same general area and draw water out of Old River (indirectly, in the case of the current location) and therefore have the same effect.

The supplemental intake is expected to provide improved water quality compared to Rock Slough, but net flows in the lower San Joaquin would be the same regardless of which intake is used.

2-23. Since publication of the draft Stage 2 EIR/EIS and since the U.S. Environmental Protection Agency's letter was written, the California State Water Resources Control Board has changed its approach for setting water quality and flow standards. In order to be responsive to requests for additional information, CCWD has analyzed the project for a variety of conditions, including 70-year hydrology for: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). These cover a wide range of alternative standards (summary results are presented in Attachment 2).

2-24. Generally, the proposed project may result in a minor increase in upstream reservoir storage, depending on Reclamation's operations. Although this increase in storage alone is probably insufficient to affect temperatures upstream, the increase along with other similar increases could improve temperature conditions upstream.

2-25. Comment noted.

2-26. Comment noted.

2-27. Comment noted. CCWD and Reclamation believe that a substantial increase in fish populations within the reservoir is beneficial, regardless of whether these populations consist of exotic species. The Stage 2 EIR/EIS does not, however, compare these increased populations with detrimental effects on Delta fish populations.

2-28. See response to comment 2-5.

2-29. Comment noted. A detailed wetland mitigation plan has been prepared and is included as an appendix to the final Stage 2 EIR/EIS.

2-30. As described in response to comment 2-3 above. The proposed project does not greatly increase CCWD's ability to divert water from the Delta. In addition, because the proposed project is intended to provide water quality and reliability benefits to growth already planned within the existing CCWD service area, the proposed project would not alter the pattern, density, or location of growth in Contra Costa County and would therefore have no effect on air quality.

2-31. See response to comment 2-30 above. The improvement of CCWD's system capacity under the No-Action Alternative would accommodate growth planned to occur within the CCWD service area. This growth is accounted for in the recently released clean air plan for the Bay Area. Therefore, growth accommodated by increased system capacity under the No-Action Alternative would be consistent with local air quality planning and would not cause additional air quality impacts.

2-32. The effects of the project alternatives on energy demand are extremely small (much less than 1% of regional energy demand) and would not significantly affect energy production or related emissions.

2-33. CCWD has already incorporated feasible measures, such as watering during construction, into the proposed project. These measures are described in the Stage 2 EIR/EIS Technical Report. The impact analysis in the Stage 2 EIR/EIS acknowledges that, even with these measures, significant air quality impacts will occur during the construction period.

2-34. Phasing construction of various project components was also considered, but phasing would not substantially reduce fugitive dust or ozone precursor emissions. Over 90% of these emissions

would result from constructing the dam and reservoir. The simultaneous contribution from the construction of other project components is minor.

2-35. No feasible measures are available to reduce the number of trips during the construction period. Construction materials must be delivered from offsite and specific quantities of various materials are required to construct the proposed project. Although the number of trips per day could conceivably be reduced, this would simply lengthen the construction period, causing increased emissions over a longer period and resulting in substantial costs to CCWD ratepayers.

Mitigation measure 14-1, which is included in the environmental commitments list in the Stage 2 EIR/EIS, would help reduce recreation-related trips to the watershed.

2-36. If the proposed project is not approved, CCWD may sell the lands it has acquired. This possible outcome of the No-Action Alternative is described on page 2-3 of the Stage 2 EIR/EIS.

2-37. Comment noted. Reclamation compliance with the Fish and Wildlife Coordination Act is included in Attachment 4. A Fish and Wildlife Coordination Act report will also be solicited from USFWS by the Corps after the notice of availability of the final EIR/EIS is published and before any decision by the Corps on the Los Vaqueros Project. The biological opinions for San Joaquin kit fox, bald eagles, Delta smelt, and winter-run chinook salmon are summarized in Chapter 20, "Consultation and Coordination".

2-38. No relationship exists between growth occurring in eastern Contra Costa County and the proposed project. In addition, the proposed project could not meet CCWD's water quality and reliability goals for an expanded service area because the sizing of proposed facilities, including the reservoir, would be inadequate. The primary reason for entering into these agreements is that the area is currently expanding, and existing water service providers are irrigation districts that are unable to provide municipal and industrial water service, even though they have adequate water supplies to serve the area.

2-39. The Stage 1 EIR for the Los Vaqueros/Kellogg Project was prepared and certified by CCWD in 1986. That EIR generally evaluated a variety of measures that CCWD could implement to improve the quality and reliability of its water supply. During the review process, 26 letters of comment were received and five people provided comments at public hearings for the project. Several comments focused on vegetation and wildlife issues, while the remaining comments were specific to the interest of the commenters.

The Vasco Road and Utility Relocation Project EIR is incorporated into the Stage 2 EIR/EIS by reference and is available for review from CCWD. Forty-two letters of comment were received and 24 people provided comments at public hearings for the EIR. Issues raised by commentors were generally focused on the effects of the project on transportation, vegetation and wildlife resources, quality of life, and mineral resources.

2-40. Chapter 5 of the Section 404(b)(1) alternatives analysis, prepared by CCWD and incorporated into the Stage 2 EIR/EIS by reference, fully addresses the issue of reliability, including potential damage to all vulnerable CCWD facilities, such as the Contra Costa Canal intake facilities, and pumping plants and power facilities, and concludes that most CCWD and appurtenant facilities could be damaged in a severe earthquake but would be operational again after a relatively short period. The controlling emergency for developing water reliability criteria is a multiple Delta levee failure, which could last from 1 to 6 months.

2-41. The wetland acreage numbers used in the wildlife chapter of the Stage 2 EIR/EIS refer to types of wetlands that provide specific wildlife values, while the acreage numbers used in the vegetation chapter refer to all areas that meet the criteria for wetlands even though they may not provide substantial wildlife values.

LETTER NO. 3

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of the Chief Scientist
Washington, D.C. 20230

CCN 17751
EN 13.2.9.5

May 12, 1992

cc: JSG
Hutton
Glines
WHB

Mr. John S. Gregg
Assistant General Manager
Contra Costa Water District
P.O. Box 4121
Concord, California 94524

Dear Mr. Gregg:

Enclosed are comments on the Draft Environmental Impact Statement for Los Vaqueros Project, Contra Costa County, California. We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

David Cottingham

David Cottingham
Director
Ecology and Conservation Office

Enclosure

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MAY 12 1992

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

COMMENTS ON LOS VAQUEROS PROJECT
CONTRA COSTA COUNTY, CALIFORNIA

The National Marine Fisheries Service (NMFS), Southwest Region, has reviewed the subject document and offers the following comments. If you have questions concerning these comments or wish to discuss the project further, please contact Michael Thabault, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404, telephone (707)578-7513, or the Protected Species Division, James Lecky, 501 West Ocean Boulevard, Suite 4200, Long Beach, California 90802-4213, telephone (310)980-4015.

The National Marine Fisheries Service is responsible for preserving and enhancing marine, estuarine, and anadromous fish resources and the habitats that support these resources. The Sacramento and San Joaquin Rivers, as well as the Delta, support many species of anadromous and estuarine fish. These include American shad, striped bass, sturgeon, steelhead trout, and chinook salmon, including the protected winter-run chinook salmon. Winter-run chinook salmon is listed as Threatened under the Federal Endangered Species Act (FR 55, No. 214, 46515). Several of these species have undergone significant declines in recent years.

General Comments

CCWD currently has a water right entitlement from the U.S. Bureau of Reclamation for 195,000 acre feet (AF) of water, of which they can deliver between 120,000-130,000 AF. Although the projected demand at full build out in a critical year is 205,000 AF, conservation and reclamation reduce that demand to 188,000 AF. All analyses in the DEIS/DEIR are predicated on delivery of near full entitlement.

We understand that CCWD has applied for an additional water entitlement from the State Water Project (SWP) for 163,000 AF for the Los Vaqueros Project (sized at 150,000 AF not 100,000 AF as reported in the DEIS/DEIR). CCWD also plans to build an additional reservoir (Kellogg Reservoir) and are applying for an additional 135,000 AF of State water. These actions should be identified and discussed in the document. 3-1

CCWD prefers 90 days of emergency storage. However, only 30-day storage can be built at this time. If the CCWD plans on fully utilizing the additional entitlement, it should be discussed in the EIS. A further consideration is that water rights are maintained through usage. It should be indicated whether CCWD plans to re-sell that water or intends for the State to reallocate the water elsewhere **until** CCWD has the capacity to use it. Any of these options will result in substantially more water exports than described in the DEIS/DEIR. 3-2

The State of California is now involved in water quality hearings to address the needs of fish and wildlife in the San Francisco Bay and Delta. The present Decision-1485 Standards are not adequately protecting fish and wildlife resources within this complex estuarine system. We believe that this Los Vaqueros Project, as well as many other projects involving increased exports from the Delta, are premature. It is anticipated that the State, at the insistence of EPA, will establish stricter water quality standards for the Bay/Delta. These standards will affect all new water management decisions, including this project's viability and the new water rights being sought. This possibility needs to be addressed. 3-3

Specific Comments

The Effected Environment Section for fisheries, Chapter 4, discusses the qualitative status of fisheries. However, there is no quantitative discussion of the impacts from existing CCWD facilities. NMFS maintains that environmental conditions in the Sacramento/San Joaquin Delta (Delta) are currently unacceptable. CCWD is contributing to these conditions. The existing intake on Rock Slough is presently unscreened. A discussion of direct losses of fish associated with this facility should be in the DEIS/DEIR. Without an appropriate baseline of information, decisions on impacts and mitigation cannot be made. The quantitative data supplied are derived from model projections. Although modelling is a useful tool, field data are needed to verify a model's conclusions. 3-4

The DEIS/DEIR discusses the significant impacts of existing facilities on fisheries. We realize that when comparing this project with the much larger State Water Project (SWP) and the Central Valley Project (CVP), CCWD exports are considerably less. However, because their proposal is smaller, they state that their impacts will not be significant. We do not agree with this conclusions. 3-5

All analyses presented use the 1922-1978 hydrologic record, yet hydrologic records are now available through 1991. Using current information will be much more representative of existing conditions. Such information would reflect the higher rates of diversions that have occurred since 1978 and the continuing 3-6

drought conditions. Additionally, to fully evaluate impacts to fisheries, an analysis should use the standard five water-year types. This will aid CCWD in analyzing operational alternatives to avoid or minimize annual impacts.

The Fisheries Impact Assessment Methodology discussed in Appendix B is identical to that presented in the Delta Wetlands Project DEIS/DEIR and the Arvin-Edison/Metropolitan Water Exchange Program DEIS/DEIR. The Los Vaqueros DEIS/DEIR should discuss how this methodology directly applies to the Los Vaqueros Project. Assumptions should be included that consider operations during all water-year types, using the expanded hydrologic record. 3-7

Mitigation measures are not adequately described. The major mitigation component identified is participation in the Two Agency Agreement negotiations. CCWD would contribute funding to ongoing habitat improvement projects identified through the Two Agency Agreement. The Two Agency Agreement was established to mitigate for past and present impacts caused by the SWP and CVP facilities and operations. Much of the mitigation described in this document is either being implemented or considered as mitigation for SWP/CVP facilities. Furthermore, the period for completing the Two Agency negotiations is not established, rendering the mitigation to be of questionable value for the Los Vaqueros Project. These negotiations may not provide adequate mitigation in the long-term, and may not mitigate for impacts to all species. The focus of the Agreement is on striped bass, salmon, and steelhead; there are other resident species not considered. Participation in, or funding of an agreement with unspecified mitigation cannot be considered adequate for this project. 3-8

The CCWD presently causes unquantified impacts to fisheries at the water intake located on Rock Slough. If that facility remains unscreened, further mitigation may be required. Some individual aspects of the mitigation do not compensate for the impacts described. Habitat restoration, although commendable, does not mitigate for direct or indirect losses of fish. Furthermore, habitat improvement outside the Delta may not adequately mitigate for losses of valuable Delta habitat. Also, without adequate freshwater flows and other fish protective measures, habitat enhancement may not be the most appropriate mitigation measure. Without a more specific plan, we cannot adequately evaluate the proposed mitigation. Hatcheries may be useful in mitigating for director indirect losses to population. However, they are not considered by NMFS as appropriate compensation for habitat losses and may not be appropriate for fish losses (e.g., winter-run chinook salmon). The DEIS/DEIR should identify realistic mitigation measures that can be readily implemented to offset all unavoidable impacts. These may 3-9

include, but not be limited to, changes in operations to avoid peak juvenile fish occurrences in the Delta or participation in Delta-wide protective fish screening programs.

Many mitigation measures outlined in the DEIS/DEIR are inappropriate to offset impacts to winter-run chinook salmon. Although Federal consultation under §7 of the Endangered Species Act has not yet been initiated by the U.S. Bureau of Reclamation, there have been discussions with them concerning the consultation. Comments concerning this project proposal, relating to winter-run, will be provided when the Biological Assessment is received by the Protected Species Division in Long Beach, California. The CCWD must be aware that, although avoiding and minimizing impacts to winter-run may accomplish a Non-Jeopardy Opinion for that species, it may not adequately address impacts to other fish species. 3-10

3-1. CCWD has two water rights applications pending before the California State Water Resources Control Board for the Los Vaqueros Project. Application 20245 is for diversion into storage of up to 163,000 af/yr at the Los Vaqueros Reservoir site or, alternatively, up to 135,000 af/yr at the Kellogg Reservoir site. Application 25516 is a partial assignment of a state filing for diversion from Kellogg Creek. Application 25516 includes a storage component of 10,800 af/yr at the Los Vaqueros Reservoir site and 14,800 af/yr at the Kellogg Reservoir site. In addition, application 25516 includes a small direct diversion component from Kellogg Creek.

Although CCWD had determined which alternatives would be addressed in its EIR/EIS for the Los Vaqueros Project, CCWD filed these water rights applications with the California State Water Resources Control Board before completing its extensive alternatives analysis and the draft Stage 2 EIR/EIS. The water rights application process provides the ability to reduce the quantities and rates of water diversion, but does not allow an application to be increased without refiling the application.

To ensure that feasible alternatives were not eliminated and to minimize potential schedule delays caused by the need to refile an application if changes in the project occurred, CCWD intentionally filed applications for larger quantities of water and greater rates of diversion than its projected need. The Stage 2 EIR/EIS, however, only analyzes, and provides environmental documentation for alternatives that are consistent with CCWD's identified water quality and reliability objectives.

The water rights applications will be reduced to be consistent with CCWD's staff-preferred alternative identified in the Stage 2 EIR/EIS. Making the water rights applications consistent with CCWD's proposed action that was addressed in the Stage 2 EIR/EIS will involve reducing the quantity of water that can be diverted to storage to 100,000 af, reducing the diversion rate at the new supplemental intake from 600 cfs to 250 cfs, and eliminating the Kellogg Reservoir site from the water rights application.

CCWD has not provided adequate environmental documentation under either CEQA or NEPA to construct or operate a project other than that considered in the Stage 2 EIR/EIS. In addition, CCWD's draft amended water service contract with Reclamation specifically states that "in utilizing its CVP water supply in conjunction with its Los Vaqueros water rights water, the District shall not deliver within its existing service area, in any one year, a quantity of water in excess of 195,000 acre-feet."

Therefore, the total amount of water available for use within CCWD's service area under both Los Vaqueros water rights and through CCWD's contract with Reclamation is 195,000 af.

3-2. CCWD's emergency storage goals vary depending on the type of year. As stated on page 1-5 under "Primary Objectives", one of CCWD's three primary objectives is to improve the reliability of the CCWD supply by providing emergency storage to supply 75% of the maximum projected 3-month demand in 2025 (56,000 af), with the provision that up to 26,000 af of this emergency storage can be used to enhance water quality during dry and critical years.

The proposed Los Vaqueros Reservoir Project achieves this objective. CCWD has no plans and no identified funding sources to construct additional storage and, as described in the response to comment 3-1 above, will modify its water rights application to conform to the project described in the Stage 2 EIR/EIS as modified by the biological assessment for fish species.

3-3. CCWD and Reclamation recognize that new water quality standards will be set in the Delta. The state is obligated to review such water quality standards every 3 years. CCWD and Reclamation continue to believe that it is appropriate to proceed with the Los Vaqueros Project at this time.

In order to be responsive to requests for additional information and to assess the project with potential water quality standards, CCWD has analyzed the project for a variety of conditions, including 70-year hydrology for: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). These cover a wide range of alternative standards (summary results are presented in Attachment 2). The analyses show that while project performance changes slightly, project impacts are the same or are less under the more restrictive standards.

CCWD currently has almost no storage in its water distribution system. If a levee failure or other event occurred that rendered CCWD's Rock Slough intake unusable, CCWD could meet its demands for only several days. This emergency supply need is unrelated to existing or future Delta water quality standards.

As a Central Valley Project contractor and holder of state water rights, CCWD would be subject to all appropriate restrictions placed on Delta diversions as a result of state water right proceedings and compliance with other state and federal laws and regulations. The Los Vaqueros Project would greatly increase CCWD's operational flexibility and could be a valuable addition to the Delta water system because it could allow CCWD to modify its operations to avoid or reduce impacts on sensitive Delta resources.

It is also important to note that the Los Vaqueros Project does not greatly increase the ability of CCWD to divert water from the Delta. Although the Los Vaqueros Reservoir would eliminate the need to make improvements to portions of CCWD's Contra Costa Canal system, other major restrictions would still exist in the CCWD system that limit the amount of water that could be put to use. Actions necessary to remove all restrictions in the CCWD system and thereby allow CCWD to make full use of its contracted water supply would involve major improvements to the Contra Costa Canal system, which is owned by Reclamation. Compliance with all federal laws and regulations, including NEPA and the federal Endangered Species Act, would therefore be required before such improvements could be made.

3-4. Direct losses attributable to CCWD's diversions are presented in the biological assessment for the proposed project. A biological assessment for fish species affected by the Los Vaqueros Project was submitted to the National Marine Fisheries Service on August 25, 1992 after several meetings to clarify fishery issues. The biological assessment presents quantitative information regarding the current effects of CCWD operations on Delta fishery conditions. This information is incorporated into the final EIR/EIS as appropriate. The biological opinion from NMFS is summarized in Chapter 20, "Consultation and Coordination".

3-5. CCWD and Reclamation recognize that the Delta fishery is being affected substantially by existing water project operations. The Stage 2 EIR/EIS makes a distinction between direct impacts of the Los Vaqueros Project on Delta system fisheries and cumulative impacts, to which the Stage 2 EIR/EIS acknowledges that CCWD is contributing, although in a very minor amount. The Stage 2 EIR/EIS does, in fact, identify numerous impacts on Delta fisheries as contributing in a minor way to significant cumulative impacts (See pages 4-25 and 4-26 for example). CCWD and Reclamation recognize and state in Chapter 4 of the Stage 2 EIR/EIS, "Delta System Fisheries", that, while project-related diversions are small compared to total Delta diversions, CCWD's incremental additions to the cumulative impact of all Delta diversions on fish populations are significant. See also response to comment 3-4 above.

3-6. The hydrologic analyses conducted for the Stage 2 EIR/EIS do not simulate actual flows that occurred historically in the Delta and upstream rivers. Instead, these models use the existing or projected water supply system, existing or projected demands for water, and the estimated hydrology of the 1922-1978 hydrologic record to simulate how the Central Valley Project and the State Water Project systems would operate under various scenarios. Therefore, adding the hydrology of the 1979-1991 period does not significantly alter the results represented in the operations modeling conducted for the Los Vaqueros Project.

Since the letter from the National Marine Fisheries Service was sent, operations studies for the period of 1922-1991 have become available. CCWD has analyzed the project for a wide range of conditions for 70-year hydrology, including: 1) D-1485 standards; 2) Draft D-1630 standards; and 3) D-1485, with the current NMFS CVP-OCAP Biological Opinion on Winter-Run Salmon (February 12, 1993) and the FWS CVP-OCAP Biological Opinion on Delta smelt (May 26, 1993). Results are summarized in Attachment 2; the studies show either no change or reduced impacts.

CCWD believes that analyzing fisheries impacts by the standard five water-year types would not provide substantial information. A brief analysis of fishery impacts by water-year was presented in the biological assessment for this project. Assessing impacts by water-year type is not particularly useful because water project operations are not restricted by year type in any 1 year. For example, a critical year following a series of wet years may not result in substantial reductions in flow or effects on fisheries because water stored in reservoirs in previous years can be used to make up for deficiencies that occur in any 1 year. Similarly, a wet year following several dry years may result in substantially more effects because much of the flow in that wet year is captured by reservoirs with increased capacity because of the previous dry years. Because no real pattern of year types exist, analyzing fishery impacts by year types provides little insight into a project's expected impacts on fisheries.

3-7. The methodologies for the three referenced projects are essentially identical because they measure the same parameters (survival of various fish species) at essentially the same locations (the Delta and upstream rivers and reservoirs) using the same input information (Delta inflow, Delta outflow, Delta export, and flow within Delta channels). The methodologies, therefore, could not be substantially different. See also responses to comments 3-5 and 3-6, above.

3-8. As a result of comments received on the draft EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta during the winter-run chinook salmon's season of highest vulnerability. This operation will allow CCWD to eliminate all its diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species. The biological opinion is summarized in Chapter 20, "Consultation and Coordination".

3-9. See responses to comments 3-4 and 3-8 above.

3-10. Comment noted. See responses to comments 3-4 and 3-8 above. CCWD and Reclamation believe that the Los Vaqueros Project will provide substantial operational flexibility and will allow better opportunities to minimize effects on other fish species.

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LETTER NO. 4

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

CC: JSG
JH
HG
WHB

June 3, 1991

Regulatory Section (199000070)

Mr. James West
Bureau of Reclamation
2800 Cottage Way (MP-750)
Sacramento, California 95825-1898

Dear Mr. West:

Enclosed are comments concerning our review of the cultural resources section of the draft Environmental Impact Statement (EIS) associated with the Los Vaqueros Project proposed by Contra Costa Water District.

In addition, eligibility determinations and effect determinations must be completed and concurrence of the State Historic Preservation Officer (SHPO) obtained prior to finalization of the EIS. The results of these determinations and consultation with the SHPO should be discussed in the final EIS. Our understanding is that you have transmitted the eligibility and effect determinations to the SHPO for review and comment.

For regulatory EISs, we require the draft eligibility and effect determinations be completed and the results discussed in the draft EIS. The draft EIS for the Los Vaqueros project does not meet the needs of our agency. However, we believe that as a result of your prompt attention to this matter, this deficiency is being resolved.

If you have questions concerning cultural resources please contact Ms. Patti Johnson, Corps archaeologist, at (916) 557-6611. Questions concerning the associated Department of Army permits should be addressed to Ms. Jean Elder in our Regulatory Section at (916) 557-5256.

Sincerely,

Art Champ
Chief, Regulatory Section

Copies Furnished:

Ms. Dana McGowan, Jones & Stokes Associates, Inc., 2600 V Street, Suite 100, Sacramento, California 95818-1914
Mr. Gary Darling, Los Vaqueros Project, Contra Costa Water District, P.O. Box 4121, Concord, California 94524

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May 1, 1992

Comments on "Los Vaqueros Draft Stage 2 Environmental Impact Report/Environmental Impact Statement for the Los Vaqueros Project", February 1992.

1. All such statements in this document such as "Until these sites are evaluated for their NRHP eligibility, all sites are assumed to be potentially eligible and any impacts on these sites would be significant" need to be revised in light of the current approach to the eligibility issue. The State Historic Preservation Officer's comments on eligibility and effects must also be included in this report as discussed previously in several meetings. 4-1

2. In a number of instances the mitigation measures offered are reputed to "ensure protection" of the cultural sites and thus there supposedly would be no impacts to the sites. It is erroneous to assume this, since mitigation measures for cultural resources cannot "ensure" that the sites will be preserved or protected. Implementation of mitigation measures results in relative, not absolute, security for the sites. There is ample data nationwide as to the effectiveness of the various kinds of mitigation. The following statements from the report demonstrate this point.

a. Page 11-21. "Fencing and monitoring to ensure that sites are protected might also be necessary and are described below." This is unclear. If fencing a site is meant, that is a known invitation to vandals. The site then becomes an "attractive nuisance" and promotes trespassing. If fencing a field or other large area is meant, then it should be realized that is not considered a deterrent. Please clarify and rethink this. 4-2

b. Page 11-23. "Impacts on some sites from increased access and vandalism can be prevented by implementing a cultural resources management plan. The plan would include restrictions for use in areas of sensitivity (e.g., restrict use near NRHP-eligible properties and provide a monitoring program to ensure that NRHP-eligible properties are protected)." Restricting access and monitoring may reduce the probability of impacts--that all depends on how restricting access and monitoring are actually accomplished--but these measures certainly do not <u>ensure</u> protection.

c. Page 11-23. "To ensure the long-term protection of these sites, the plan would provide guidelines to prevent impacts on cultural resources, such as restrictions for use in areas of

sensitivity, a long-term monitoring program to ensure that NRHP-eligible properties are protected in the future." This is the same as paragraph b. above and the same comment applies. Impacts are not going to be prevented, such measures are redoing the probability of damage.

There are a number of other instances in this report where mitigation measures are discussed in this manner. It is misleading to the decision-makers who will assume that all that is required is implementation of these measures and the problems are solved. Mitigation measures should be viewed as risk reduction not risk elimination. The latter is an impossibility in most cases. This report needs to be rewritten in all instances where mitigation is discussed to reflect what actually can be accomplished, not some ideal that will not be reached.

3. Page 11-6, Study Findings. There is at this time an Area of Potential Effect (APE) for this project. Using the word "tentative" APE suggests that there is a great deal of fluidity to the APE. It should be understood that virtually all projects undergo change to various features. It is suggested that "tentative" be eliminated, assume a given APE and identify it. Changes to the APE can be addressed by stating that such revisions will be subjected to review by the SHPO along with identification of the cultural sites affected. 4-3

4. Page 11-8, Impact Mechanisms. Revise "The alternatives considered in this EIR/EIS could affect historic, archeological, architectural, or traditional cultural properties eligible for the NRHP" to ... will affect.... Based on the current approach to the eligibility issue, it is most certain that the alternatives will indeed affect historic properties. It is not a possibility--affects will occur. The use of the word "could" is appropriate where impacts or mitigation measures to specific sites may not be known at this time. The decision-makers reading this report need to understand that impacts of some type are a certainty.

5. Page 11-9, Reservoir Operation. Revise "Fluctuating reservoir levels and the amount of water released into Kellogg Creek could affect historic properties near the reservoir high-water mark and downstream of the dam. Fluctuating water levels and hydrodynamic action could erode and degrade historic properties located at the water's edge". Again, fluctuating reservoir levels are known, virtually without exception, to erode sites. What is the point of referring to this as a possibility when it is indeed a certainty. Fluctuating water levels are perhaps the most damaging of impacts other than destruction by construction. The "could" in these two instances should be changed to "would". The "could" in "Land Management: Grazing Practices,...Fire,...Dryland Farming...." etc. is appropriate since there are options to impacting the sites. 4-4

6. Page 11-9. Should there not be a "Land Use: Mitigation 4-5

Lands" section, since there will probably be mitigation lands other than the watershed lands?

7. Page 11-11, Purchase of Lands. "Limited access to, and a protection program for, the caves also will protect the archeological values present." See comment 2 above. Limited access to, and a protection program for the caves will reduce the risk of vandalism. It will not eliminate it. 4-6

8. Page 11-21. Use the proper and legal term "State Historic Preservation Officer". The only time Office of Historic Preservation (OHP) is appropriate is when the actual agency is being referenced such as in Table 20-1. 4-7

9. Page 11-21, Assess APE for Sensitivity of Buried Resources.... "If buried sites are found, they will need to be considered as part of the Section 106 review process." This sentence needs to be revised to something like "If buried sites are found, they will need to be evaluated for eligibility to the National Register of Historic Places and appropriate treatment developed in accordance with the Section 106 consultation process." 4-8

10. Page 11-21, Design Project Facilities to Be Unobtrusive. Revise the paragraph to read: "...the facility should be designed to be architecturally compatible with historic properties and should be designed to blend visually with the surrounding area. Where appropriate, landscaping should be used to screen facilities from historic properties and to avoid or reduce visual impacts. The design of such facilities and landscaping would be undertaken in consultation with the SHPO." 4-9

11. Page 11-22, Site Evaluation and Data Recovery Measures. Rewrite this paragraph with current approach as the basis for discussion. 4-10

12. Page 11-23, Impacts on Cultural Resources from Long-Term Management Practices. Rewrite these two paragraphs from the point of view of risk reduction as discussed in comment 2 above. 4-11

13. Page 11-24. Potential Impacts on Cultural Resources within Unsurveyed Portions of the Project Area. Revise last sentence in paragraph similarly to comment 9 above. The phraseology is awkward and appears as a "short-hand" version of what is really meant. 4-12

14. Page 18-11. Environmental Consequences. Cultural Resources. First, this section is too brief. In accordance with CEQA guidelines and NEPA regulations as cited on page 18-1, past and present as well as reasonably foreseeable future actions should be identified. The level of analysis for cultural resources is not consistent with that of other resource analyses which have some measure of quantification. For example, why not identify how many known sites are in east county and the 4-13

percentage of these that have been destroyed by development. Discuss how this project compares to that level of destruction (or preservation, as the case may be).

Second, the last sentence of the paragraph is an erroneous conclusion. Preserving sites in one area does not compensate for the loss of sites in another. There is obviously as assumption that archeological sites are alike, therefore, if some are preserved in one location, then it is acceptable to destroy others in the project area. Please note that <u>each</u> archeological site is unique in some manner and provides data different than any other. If this were not the case, test excavation and data recovery would hardly be necessary. It should also be noted that data recovery as such does not entirely compensate for the loss of a site since the samples recovered are usually so small and the rest of the site may be completely destroyed.

It should be remembered that preservation, not mitigation, is the preferred alternative as directed by Federal law. This cumulative impact summary, as well as other statements in the document regarding mitigation appear to be complying with the process only without any real understanding of what will actually happen to the sites. That approach does not constitute a full disclosure as required for an EIR/EIS.

15. Page 20-11. Agency Authority. The SHPO has more functions, especially since this is an EIS as well as an EIR, than simply commenting on eligibility. Also the National Historic Preservation Act as referenced in this table actually cites the Advisory Council on Historic Preservation (ACHP), who is a party in the Section 106 consultation process. The ACHP should also be mentioned. 4-14

4-1. Chapter 11 of the final EIR/EIS contains a description of activities conducted in compliance with Section 106 of the National Historic Preservation Act since publication of the draft EIR/EIS. Attachment 3 to the final EIR/EIS includes a letter from the State Historic Preservation Officer expressing concurrence with these findings.

CCWD, Reclamation, the U.S. Army Corps of Engineers, the California State Water Resources Control Board, and the State Historic Preservation Officer have developed and executed a programmatic memorandum of agreement that will determine how mitigation will be conducted for properties eligible for listing in the National Register of Historic Places. The agreement is also included in Attachment 3.

4-2. The intent of the mitigation measures is to reduce the impacts caused by the proposed action to a less-than-significant level. CCWD and Reclamation recognize that these measures will not ensure protection from all possible non-project-related impacts, but believe that the measures described in the EIR/EIS are appropriate and will reduce impacts to less-than-significant levels.

For example, the fencing measure discussed in the EIR/EIS on page 11-21 is specifically aimed at preventing incidental impacts from construction activities and would be a short-term measure that would allow construction monitors to clearly delineate to construction crews areas to avoid. CCWD and Reclamation recognize that approval of the basis on which the Los Vaqueros Project will comply with Section 106 is necessary before receiving permits from certain state and federal agencies and has proceeded with studies based on that knowledge. The process is described on page 11-21.

4-3. At the time the draft EIR/EIS was published, an area of potential effect (APE) had not yet been firmly established. Since publication of the draft EIR/EIS, substantial progress has been made in complying with Section 106. This progress is discussed in Chapter 11 of the final EIR/EIS.

4-4. The section discussed in this comment was written to generally describe potential impact mechanisms, not to describe impacts. Impacts of the project alternatives on historic properties are described under "Environmental Consequences" in Chapter 11 of the EIR/EIS. Impacts of reservoir operation on historic properties are described on page 11-11.

4-5. Comment noted. The final EIR/EIS has been modified to reflect this change.

4-6. See response to comment 4-2, above.

4-7. Comment noted. All references to "OHP" have been changed to "SHPO" in the final EIR/EIS.

4-8. Comment noted. The possibility of buried sites and the steps necessary to comply with Section 106 will be included in the cultural resources management plan and construction monitoring plan. Appropriate changes have been included in the final EIR/EIS.

4-9. Comment noted. The final EIR/EIS has been modified to reflect this change.

4-10. Substantial progress has been made in complying with Section 106 since publication of the draft EIR/EIS. This progress is discussed in Chapter 11 of the final EIR/EIS.

4-11. See response to comment 4-2, above.

4-12. Comment noted. The final EIR/EIS has been modified to reflect this change.

4-13. CCWD and Reclamation believe that the cumulative impact analysis is appropriate. Mitigation measures proposed for the Los Vaqueros Project would fully compensate for the loss of cultural resources attributable to the proposed project and implementation of the programmatic memorandum of agreement will result in no adverse effect to cultural resources. Therefore, the Los Vaqueros Project would not contribute to significant cumulative impacts.

4-14. Comment noted. The final EIR/EIS has been modified to reflect this change.

LETTER NO. 5

STATE OF CALIFORNIA CCN17341 EN 13.2.9.5

PETE WILSON, Governor

STATE WATER RESOURCES CONTROL BOARD
THE PAUL R. BONDERSON BUILDING
901 P STREET
SACRAMENTO, CA 95814

916/657-2199

FAX: 916/657-2388

Mailing Address
DIVISION OF WATER RIGHTS
P.O. BOX 2000, Sacramento, CA 95812-2000

dcc: Hutton Glines Blackmon JSG

In Reply Refer to: 316:RAS

MAY 11 1992

Mr. John S. Gregg
Program Manager
Los Vaqueros Project
Contra Costa Water District
1331 Concord Avenue
Concord, CA 94524

Mr. Gary Darling
Los Vaqueros Project
Contra Costa Water District
P.O. Box 4121
Concord, CA 94524

Gentlemen:

CONTRA COSTA WATER DISTRICT/U.S. BUREAU OF RECLAMATION DRAFT STAGE 2 ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR THE LOS VAQUEROS PROJECT (SCH NO. 91063072)

Staff of the California State Water Resources Control Board (State Water Board), Division of Water Rights, Environmental Section, have reviewed the above-referenced February 1992 Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) prepared by the Contra Costa Water District (CCWD) and the U.S. Bureau of Reclamation (Reclamation). Our comments follow:

A. GENERAL COMMENTS

In 1991 and 1992 three separate water right actions involving applications for new water rights and petitions to change existing water rights were filed with the State Water Board by CCWD and Reclamation relative to the proposed Los Vaqueros Project. These actions are:

Application 20245

On January 24, 1991 CCWD filed a petition to amend Application 20245, under California Water Code Section 1700 et seq., which was originally filed on June 5, 1961. Under amended Application 20245, CCWD proposes to divert up to 163,000 acre-feet (af) of water per year from Old River tributary to San Joaquin River, during the period of November 1 to June 30, at a maximum rate of diversion not to exceed 600 cubic feet per second (cfs). Water diverted will be collected at a point of rediversion to offstream storage in either Los Vaqueros Reservoir or Kellogg Reservoir for municipal, industrial, domestic, irrigation, recreation, incidental fish and wildlife preservation and/or enhancement, and water quality purposes throughout Contra Costa County.

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Application 25516

On August 30, 1991 CCWD filed a petition, under California Water Code Section 10500, et seq., for partial assignment of state filing Application 25516 which has a priority date of September 30, 1977. Under this petition, CCWD proposes to divert up to 14,800 af of water per year from Kellogg Creek tributary to Old River during the period of January 1 to December 31. The water will be diverted to onstream storage in either Los Vaqueros Reservoir or Kellogg Reservoir for the same purposes and place of use as identified above under Application 20245.

Applications 5626, et al.

Currently, CCWD has a contract with Reclamation for the delivery of up to 195,000 af of water from Rock Slough under water right permits currently held by Reclamation. On November 22, 1991 and February 25, 1992 Reclamation filed petitions, under California Water Code Section 1700, et seq., to: (1) add the proposed points of diversion and rediversion in CCWD's Application 20245 as points of diversion and/or rediversion in Reclamation's permitted Application 5626 and 16 other Reclamation permits, (2) add municipal and industrial purposes to Reclamation's permitted Applications 9364 and 9366, and (3) add CCWD's proposed place of use for CCWD's Applications 20245 and 25516 as a place of use under Reclamation's permitted Application 5626 and 16 other Reclamation permits.

Since CCWD is the lead agency for the project, pursuant to the California Environmental Quality Act (CEQA), CCWD assumes primary responsibility under applicable California laws and regulations for: (1) preparing an adequate environmental document for the project, pursuant to CEQA, which fully discloses the potential environmental impacts of the project and feasible mitigation measures to avoid potential significant impacts or reduce them to nonsignificance, and (2) implementing reasonable and feasible mitigation measures to avoid potential significant impacts of the project or reduce them to nonsignificance. The State Water Board, as a Responsible and Trustee Agency for the project, must consider an adequate environmental document prepared by CCWD before it can consider approving the project and issuing the requested water right permits to CCWD and permit changes to Reclamation.

As State Water Board staff has mentioned at several interagency staff meetings with CCWD's consultants preparing the Draft EIR/EIS, the scope of the project that was being defined in both interagency consultation meetings and in the recent administrative Draft EIR/EIS is much smaller than the maximum scope of the project that can be defined based on CCWD's applications and Reclamation's petitions currently pending before the State Water Board. Judging from the above-discussed pending applications and petitions, the overall scope of the project could involve a maximum diversion and/or rediversion of up to 372,800 af/yr from Rock Slough

5-1

and Old River (including up to 14,800 af/yr from Kellogg Creek tributary to Old River). This figure of 372,800 af is derived by summing the above-discussed maximum annual diversion and/or rediversion amounts for contractual water service to CCWD under Reclamation's water rights (195,000 af) and CCWD's proposed new water rights for Applications 20245 (163,000 af) and 25516 (14,800 af). Both the administrative and final Draft EIR/EIS, however, define the scope of the project as involving a maximum annual diversion from Rock Slough and Kellogg Creek tributary to Old River of only about 188,000 af. Thus, the scope of the project being defined in the Draft EIR/EIS is about half of the theoretical scope of the project currently pending before the State Water Board.

Based on past experience, CCWD and Reclamation should understand that, given the existing environmental document, the State Water Board will likely develop permit terms which limit combined maximum annual diversions from the Delta by the project, under both CCWD's and Reclamation's water rights, to no more than the maximum levels identified in the Draft EIR/EIS. If this is acceptable to CCWD, please inform us in writing within 30 days of the date of this letter. Your response to this issue is important, since it will affect our ability under Section 4.A.(7)a. of the State Water Board's Agreement No. 1-905-300-0 with CCWD, to determine whether the Draft EIR/EIS currently provides an adequate basis for evaluating project impacts at a water right hearing.

B. SPECIFIC COMMENTS

1. Pages 1-10 through 1-11, Hydrologic Models:

The discussion on use of the hydrologic model DWRSIM to assess effects of the project alternatives on upstream rivers and reservoirs indicates that model simulations of the project at CCWD's full buildout level used the average critical year demands of 188,000 af/yr and average noncritical year demand of 174,600 af/yr derived from Table 1-1 on page 1-8. In view of the statement on page 1-10 (first paragraph) that maximum demands at full buildout could be as high as 197,400 af/yr in critical years and 183,300 af/yr in noncritical years, we believe that model simulations should have been run at these levels in order to estimate potential "worst case" environmental impacts of the project compared to the other alternatives. Consequently, we request that further model simulations be conducted covering this possible "worst case" scenario and that appropriate revisions be made in the Final EIR/EIS as to conclusions regarding the potential maximum environmental effects of the project at full buildout. 5-2

2. Page 1-11, Fischer Delta Model:

   Same comment as for Item B.1 above, but directed with regards to predictions of impacts on Delta salinities. 5-3

3. Page 1-12, Los Vaqueros Operation Model:

   The discussion indicates that model runs were made of the project involving a new supplemental Delta intake operating at a rate of 200 cfs whereas on page 2-17, the proposed design level for this facility is apparently 250 cfs. This inconsistency should be corrected in the Final EIR/EIS. Moreover, since CCWD has proposed in its water right Application 20245 a maximum design rate of up to 600 cfs for this facility, either the model runs should be rerun using a maximum diversion rate of 600 cfs or CCWD should revise its Application 20245 to reduce its proposed maximum rate of diversion from 600 cfs to either 250 or 200 cfs. 5-4

4. Page 1-13, Purpose of Joint Stage 2 EIR/EIS:

   The discussion lists major approvals or decisions needed for project construction and operation including: "issuance of water right permits by SWRCB to allow a storage reservoir and impoundment of Kellogg Creek waters". The words "Delta and" should be inserted after the word "impoundment". Also, no mention is made of the requirement for State Water Board approval of the pending Reclamation petitions to amend 17 of its water right permits as part of the project. These petitions are discussed in our general comments above and should be added in the Final EIR/EIS among the list of items requiring approval. 5-5

5. Page 2-6, Third Paragraph:

   The discussion indicates that in wet and normal years the project would be operated to provide a 90-day emergency supply at the peak three-month demand level, but in dry and critical years the emergency supply would be reduced to 30 days at the peak one-month demand level due to use of up to 56,000 af of stored water for water quality blending and enhancement purposes. This change in operating criteria provides additional water supply in dry and critical years. This water supply feature of the project needs to be made more clear in the Final EIR/EIS as a key project purpose. 5-6

6. Page 2-17, Supplemental Intake Facilities:

   See Comment B.3 above. 5-7

7. Page 3-13, Methodology:

In this section, the Draft EIR/EIS states: "Existing conditions consists of the facilities, water supply demand, and operational rates that existed in 1990". For CEQA purposes, this statement is incorrect. It represents average conditions assuming a 1990 Level of Development (LOD). This is not an actual figure. For example, average annual CVP and SWP exports have never been as high as 6.15 million af. Actual exports in the last 10 years have been much less than the the 1990 LOD. The use of the 1990 LOD overestimates present usage and therefore underestimates the effects of future increases. This paragraph should be rewritten to distinguish the difference between actual recent historical conditions, and 1990 LOD for modeling purposes. 5-8

8. Page 4-10, Criteria for Conclusions of Significance:

The last sentence of the second paragraph in this section states:

> "For species that are substantially affected by existing conditions (e.g., striped bass), impacts may be considered significant if the conditions contributing to existing effects are substantially worsened by project alternative operations."

We do not concur with this apparent assumption that any incremental impacts contributing to existing significant effects would not be considered significant unless the impacts themselves are substantial. To the contrary, in accordance with Section 15065(c) of the State CEQA Guidelines, any incremental change which aggravates an existing significant impact must be considered a significant cumulative impact. Therefore, the above identified quotation should be revised in the Final EIR/EIS to conform to the appropriate definition of a significant cumulative impact. Further, all incremental impacts of the project alternatives identified in this Draft EIR/EIS should be shown in the Final EIR/EIS to be <u>significant cumulative impacts</u> if they contribute by any degree to existing significant impacts. 5-9

9. Pages 4-14 and 4-16, Losses from Entrainment:

The Draft EIR/EIS states that under the No-Action Alternative entrainment of winter-run chinook salmon and Delta smelt would be reduced because of less April diversion. What is the basis for assuming that diversions in April would be reduced and where are these reductions expected to occur? 5-10

10. Page 4-16, Delta Outflow Effects on Migration and Habitat Quality in the Bay:

    The last two sentences in this section are confusing and should be revised to clarify exactly what point is being made about the relationships of flow changes on organisms in Suisun Bay and San Pablo Bay. 5-11

11. Page 4-24, Effects of Delta Cross Channel Diversions on Migration and Survival:

    Under the discussion on future conditions with the project, the Draft EIR/EIS states that in model simulations comparing the Los Vaqueros Reservoir alternative to existing conditions, the increase in proportion of Sacramento River water diverted through the Delta Cross Channel would increase by less than one percent. If this one percent figure is an average value, then the maximum percentage (i.e., worst case) should also be given and the resulting impact assessment should take this worst case scenario into account. Also, how would this worst case scenario change if the model simulations were run at a maximum project diversion level of 197,400 af in critical years in accordance with Comment B.1 above?

    Further, the Draft EIR/EIS states:

    > "The Los Vaqueros Reservoir Alternative would slightly increase the chinook salmon mortality rate because it would slightly increase the number of outmigrant chinook salmon juveniles that would enter the central Delta as compared to the No-Action Alternative. Because of its small magnitude, this project-related impact would be less than significant." 5-12

    We do not concur with the conclusions drawn that impacts of the project on chinook salmon mortality is not significant. In the first place, we do not consider it appropriate for the impact analysis to be based on a comparison of the project to the No-Action Alternative since the No-Action Alternative assumes construction of new facilities to allow increases in annual Delta exports under the contract with Reclamation from the current maximum level of 130,000 af to 195,000 af. Instead, the analysis should be based on a comparison of the project with existing conditions. Secondly, for reasons discussed in Comment B.8 above, the environmental impact of the project on chinook salmon mortality should be considered a significant cumulative impact and appropriate mitigation measures should be proposed.

12. Pages 4-24 through 4-26, Lower San Joaquin River Flow Affects on Migration and Survival:

    With regard to assessment of project impacts on striped bass and Delta smelt, we have the same concerns as identified in Comment B.11 above. Conclusions regarding hydrologic changes based on model simulations should take into account the worst case scenario involving a maximum project diversion rate of 197,400 af in critical years. Impacts of the project should be based on a comparison of the project to existing conditions, not to a No-Action Alternative which includes up to 67,400 af of increased Delta exports. Incremental impacts of the project on striped bass and Delta smelt mortality should be considered significant cumulative impacts. 5-13

    Further, the entire striped bass analysis is based on changes in the "striped bass abundance index" (38 mm index). Recent DFG modeling indicates that adult abundance is strongly affected by export and outflow rates during the rest of the year, not just during the April to July period. No consideration of the impacts of substantially increased fall and winter diversions on adult striped bass abundance is included in the Draft EIR/EIS. This needs be corrected in the Final EIR/EIS and mitigation measures proposed where appropriate.

13. Pages 4-26 through 4-30, Losses to Entrainment:

    The Final EIR/EIS should include a determination as to whether the design criteria being followed for this proposed fish screen facility meets the standards and requirements of DFG and NMFS. Further, conclusions that the project would reduce fish entrainment losses based upon a comparison against the No-Action Alternative are inappropriate since the No-Action Alternative assumes increases in unscreened Delta exports of up to 67,400 af. Impacts of the project on entrainment of juvenile chinook salmon, striped bass, Delta smelt and American shad should be based on a comparison with existing conditions. Also, see comment B.12 above regarding the striped bass impact analysis. 5-14

14. Page 4-30, Delta Outflow Effects on Migration and Habitat Quality in the Bay; Pages 4-30 through 4-31, Flow Effects on Habitat Availability and Migration in Rivers:

    Conclusions drawn that impacts of the project would not be significant because they involve small incremental changes should be reevaluated based on the above-discussed criteria for establishing a significant cumulative impact. 5-15

15. Page 4-31, Kellogg Reservoir Alternative: 5-16

Same comments as above for Los Vaqueros Reservoir Alternative.

16. Page 4-54, Mitigation Measures for Delta-Related Impacts:

In this section, the Draft EIR/EIS acknowledges that the project would contribute to significant cumulative impacts on Delta fish, but implies that such cumulative impacts would occur only because of projected future developments by other agencies. An analysis of the potential cumulative impacts of these proposed future developments is presented on pages 4-43 through 4-51 of the Draft EIR/EIS. However, as discussed elsewhere in our comments herein, we believe the project would contribute to existing significant impacts in the Delta, and such impacts should be considered as significant cumulative impacts regardless of whether or not these proposed future developments are constructed. Consequently, with regards to proposed mitigation measure 4-3, more attention should be focussed on steps CCWD and Reclamation can take independently to reduce the specific incremental impacts of the project, rather than relying on mitigation measures which may or may not be developed by other agencies for other projects. 5-17

17. Page 4-55, Kellogg Reservoir Alternative: 5-18

Same comments as above for Los Vaqueros Reservoir Alternative.

18. Pages 7-18 through 7-19, Land Use: Recreation:

The discussion indicates that impacts on botanical resources of expected changes in recreational uses in the project area have not been identified because a final recreation plan has not yet been developed. A final recreation plan should be provided in the Final EIR/EIS along with an analysis of expected impacts on botanical resources and necessary mitigation measures. 5-19

19. Pages 7-35 through 7-44, Mitigation Measures for Impacts on Botanical Resources Common to All Alternatives:

In general, the approach being taken towards developing appropriate measures to mitigate these impacts appears adequate at this stage. However, most of the recommended items involve further site-specific surveys and investigations to determine what specific mitigation measures will actually be needed. Such site-specific surveys cannot be considered by themselves to be mitigation measures, but only a means to determine what those actual mitigation measures should be. Therefore, with regards to the selected alternative, the Final EIR/EIS 5-20

should provide more site-specific detail as to the actual on-the-ground measures that should be implemented to accomplish the mitigation objectives. Particular attention should be directed towards achieving no net losses to wetland habitats and special status plant species.

20. Pages 7-45 through 7-47, Additional Mitigation Measures for Impacts on Botanical Resources of the Los Vaqueros Reservoir Alternative:

In this section, recommended measures are proposed to accomplish mitigation for the impacts on botanical resources of the Los Vaqueros Reservoir Alternative not previously addressed in measures common to all the alternatives. Again, as discussed in Comment B.19 above, the approaches being recommended are adequate for this stage of the planning process, but involve further site-specific surveys and investigations to determine the actual mitigation measures needed. Since the Los Vaqueros Reservoir Alternative is likely to be the selected alternative, we expect the Final EIR/EIS to provide a more detailed and site-specific mitigation plan for this alternative. In particular, more detail needs to be provided on exactly how compensation for the unavoidable loss of 180 acres of mature valley oak woodland habitat will be accomplished. Further, we do not concur with the assumption given that losses of such oak woodland habitat values, which would not be replaced for over 75 years, can be considered as short-term losses. These losses should be considered as long-term, significant impacts because they span a period far beyond the planning period for the entire project, which does not appear to extend beyond the year 2035. In view of this, additional measures need to be developed to compensate for such significant losses. 5-21

21. Pages 7-47 through 7-48, Kellogg Reservoir Alternative:

Same as Comment B.20 above for Los Vaqueros Project in the event this alternative becomes the selected alternative. 5-22

22. Page 8-23, Summary of Impacts on Wildlife Common to All Alternative Configurations and Conclusions of Significance:

Under the topic of Common Wildlife Species, the discussion states:

> "Loss of 185 acres of valley oak woodlands and savanna would also be considered a less-than-significant impact on wildlife even though this habitat is important for wildlife species. Oak woodlands are common in the project area, and over 4,000 acres of blue oak woodlands would be purchased and protected by CCWD." 5-23

We do not concur that these losses should be considered nonsignificant. Senate Concurrent Resolution No. 17 (September 1,

1989) specifies that state agencies exercising land use planning duties and management with respect to public and privately owned oak woodlands undertake measures "to preserve and protect native oak woodlands to the maximum extent feasible and consistent with the performance of their duties and responsibilities, or provide for replacement plantings where Blue, Engelman, Valley, or Coast Live Oak are removed from oak woodlands". In view of this, the Final EIR/EIS should identify these losses as significant and identify specific measures by which the 4,000 acres of blue oak woodlands to be purchased by CCWD would be managed to enhance wildlife habitat values in full compensation for these losses.

23. Pages 8-40 through 8-45, Mitigation Measures for Impacts on Wildlife Resources:

With the exception of valley oak woodland habitat, the mitigation measures proposed appear to be adequate at this stage. However, as in the case of mitigation for impacts on botanical resources, more detail, in terms of site-specific plans, should be identified for the preferred alternatives in the Final EIR/EIS. With regards to valley oak woodland habitat losses, specific measures should be proposed to manage the 4,000 acres of Blue Oak woodland habitat purchased by CCWD to enhance wildlife habitat values in compensation for these significant losses. 5-24

24. Page 11-3, Cultural Resources Studies Undertaken to Date:

Reference the latest technical studies (1991 Bramlette, et al. and 1991 Praetzellis, et al.) in the last two paragraphs. 5-25

25. Page 11-4, First Paragraph:

To be a full disclosure document, the Final EIR/EIS needs to include more than an inventory of cultural resources. The Determinations of Eligibility (DOE) for inclusion in the National Register of Historic Places (NRHP), assessment of effects and mitigation measures must also be included. A Programmatic Memorandum of Agreement (PMOA) identifies the procedures to develop the cultural resources management plan that will outline the mitigation measures. The Army Corps of Engineers and the State Water Board should also be included. 5-26

26. Page 11-6, Fourth Paragraph:

Reference is made to a "tentative APE". There is an existing APE for this project. It should not be referred to as tentative. It is understood that there will be project changes, but these should be able to be incorporated if the original work has been inclusive and the PMOA is flexible. Changes should also be reviewed by the appropriate agencies. 5-27

27. Pages 11-8 and 11-9, Impact Mechanisms:

Include "mitigation compensation areas" as an additional impact category. Mitigation lands utilized to compensate for other values (i.e., wildlife, botanical, visual and recreation resources) need to be inventoried for cultural resources. Such resources then need to be evaluated, assessed for effects and appropriate mitigation needs to be implemented in accordance with the Section 106 consultation process. 5-28

28. Page 11-9, Reservoir Operation:

The statements that fluctuating reservoir levels and changes in amounts of water released "could" cause erosion need to be more definitive. It is not just a possibility, it is a fact and needs to be addressed as such. 5-29

29. Page 11-10, Assessment of Impacts:

This needs to be rewritten to reflect the recent cultural resources work--it is too tentative. Again, the DOE and assessment of effects must be included in the final document. Additional information also needs to be provided regarding Native American concerns. 5-30

30. Page 11-11, Recreational Facilities:

The document states that recreational facilities:

> "...could result in direct and indirect impacts on cultural resources".

Recreational facilities <u>will</u> result in impacts on cultural resources. State Water Board staff requested they be handled as a direct impact in previous comments on the technical document referenced as 1991 Bramlette, et al. 5-31

31. Pages 11-10 through 11-20, Summary of Impacts and Conclusions of Significance Sections for each of the Project Configurations:

All of these sections should be rewritten to accurately reflect the updated cultural resources work as it is necessary to include the DOE and assessment of effects for all sites in the Final EIR/EIS. The possibility of buried sites and their treatment should be included in the cultural resources management plan. 5-32

32. Page 11-20, Mitigation Measures:

The first sentence states:

> "As impact areas for the preferred alternative are further refined, each site potentially affected by the preferred alternative will be assessed to determine the appropriate method of mitigation or avoidance."

5-33

By the time the Final EIR/EIS is completed, it should already be determined which sites will be affected so that this section can be updated to propose the necessary site-specific mitigation measures.

33. Pages 11-20 through 11-24, Site Avoidance Measures:

CEQA (Section 21002) requires that "public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects and that the procedures required by this are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects."

5-34

Avoidance of cultural resources is the preferred mitigation measure in both the state and federal processes. Excavation of sites to recover a small sample of data that may answer scientific questions is a destructive process in itself. Fencing and monitoring of sites also has been proven to be ineffective, often inadvertently drawing more attention to the sites. On page 11-21, discuss possible fencing or signing alternatives. This entire section should be revised to reflect that site evaluation, assessment of impacts and Section 106 compliance are required prior to permitting by the state and federal agencies.

34. Pages 11-21 through 11-23, Recommended Site Preservation and Protection Measures:

Fencing and monitoring plans and cultural resources management plans will not necessarily ensure protection of sites. Impacts may be reduced but they cannot "ensure protection".

5-35

35. Page 11-21, Measures 11-4 and 11-5:

Regarding Measure 11-4, edit the last sentence for "how and when the Section 106 compliance will occur." This is incorrectly used; clarify as also was previously requested in the review of the technical document (1991 Bramlette, et al.). Regarding Measure 11-5, the facilities design and landscaping should also be reviewed by SHPO.

5-36

36. Page 11-22, Measure 11-6:

This information is also necessary for the water rights process. There needs to be more information provided, including but not limited to: (a) determination of Native American involvement and the nature of their uses of the area from the past through the present time (i.e., habitation, religious/ceremonial, resource procurement areas and trail and trade networks), (b) documentation of Native American interest in the cultural deposits, (c) the range of their concerns regarding the proposed project and its potential impacts on both the ethnographic resources and the environment; and (d) an assessment of impacts and recommendations for mitigation of any impacts resulting from the proposed project. 5-37

37. Page 11-22, Site Evaluation and Data Recovery Measures:

Evaluation of eligibility cannot be considered as a mitigation measure. This section should be edited in light of the current direction of cultural resources evaluations. References to "OHP" throughout the document should be edited to reflect the correct acronym of "SHPO". 5-38

38. Page 18-9 through 18-11, Cumulative Impacts of Los Vaqueros Reservoir Alternative on Vegetation and Wildlife Resource: 5-39

See comments B.19, B.20, B.22 and B.23 above.

39. Page 18-11, Cultural Resources:

This cumulative impact analysis is incomplete. It needs to be fully developed to include at least the following: (a) what are the possible cumulative impacts on cultural resources that could be caused by the project alternatives?, (b) what are the types of sites present and how have they been historically impacted? and (c) address the types of "reasonably foreseeable probable future projects" that may affect the cultural resources. Even with mitigation, overall cumulative impacts of past, current and future projects can be significant. 5-40

40. Pages 19-1 through 19-2, Significant and Unavoidable Impacts of Los Vaqueros Reservoir and Kellogg Reservoir Alternatives:

In view of our comments above regarding the environmental impact analysis in Chapters 4, 7 and 8 of this Draft EIR/EIS, additional items should be added concerning the potential significant cumulative impacts on Delta fish, botanical resources (particularly valley oak woodland) and wildlife resources (particularly valley oak woodland 5-41

habitat) if the revised mitigation measures in the Final EIR/EIS are not sufficient to mitigate these impacts to nonsignificance. Further, if the revised mitigation measures are considered to fall short of full mitigation for these impacts, CCWD should be advised to consider adopting a statement of overriding considerations upon approval of the Final EIR/EIS and final project.

41. Pages 19-4 through 19-8, Environmental Commitments:

This section takes a very important step towards identifying the specific mitigation measures CCWD and Reclamation will need to implement in order to assure that the project is carried out without causing significant environmental damage. However, as discussed in our comments above, additional mitigation measures are needed and many of the measures currently identified involve further site-specific studies and investigations which are not themselves mitigation measures, but only a means to identify the final site-specific mitigation plans. To the extent possible, the Final EIR/EIS should identify in this section those site-specific plans for the selected alternative. Further, site-specific monitoring measures should be added, pursuant to CEQA, Section 21081.6, to assure that the mitigation measures implemented actually accomplish the mitigation objectives. This information will need to be made available to the State Water Board prior to its water right hearing on the proposed water right applications and petitions for the project. 5-42

With regards to mitigation measures for impacts on cultural resources identified on page 19-7, Measures 11-6 and 11-7 should be changed to reflect the current cultural resources work. Measure 11-6 (consultation with Native American Groups) is a continuing process, not a mitigation. Regarding Measure 11-7 (Evaluation of sites and data recovery), the evaluation of sites will soon be completed.

42. Page 20-1, Staged Environmental Review Process:

This section describes the staged environmental review process being undertaken by CCWD. If the Final Stage 2 EIR/EIS does not include final site-specific mitigation plans for the project, will a supplemental (i.e., Stage 3) environmental document be prepared to disclose this information? 5-43

43. Page 20-16, National Historic Preservation Act:

The discussion states: "If the project is determined to have an adverse affect on NRHP-listed properties or those eligible for listing in the NRHP the agency is required to consult with the SHPO...." The regulations require an agency to do the DOE in consultation with SHPO. 5-44

44. Page 20-17, American Indian Religious Freedom Act of 1978:

This section states: "The discussions between CCWD, Reclamation and Native American representatives revolved around the reinternment...." Is this a correct statement? Were the discussions primarily regarding reinternment? 5-45

Thank you for the opportunity to comment on the Draft EIR/EIS. If you have any questions, please call me at 916/657-1981 or call Mr. Ross Swenerton, Chief, Environmental Review Unit 2, at 916/657-2199. Mr. Swenerton is the staff person currently assigned to coordinate environmental review of this project.

Sincerely,

for

Gerald E. Johns
Assistant Division Chief

cc: Mr. Douglas Kleinsmith
U.S. Bureau of Reclamation
Environmental Compliance Branch
Division of Planning
2800 Cottage Way, Room W-2103
Sacramento, CA 95825-1898

5-1. CCWD has two water rights applications pending before the California State Water Resources Control Board (SWRCB) for the Los Vaqueros Project. Application 20245 is for diversion into storage of up to 163,000 af/yr at the Los Vaqueros Reservoir site or, alternatively, up to 135,000 af/yr at the Kellogg Reservoir site. Application 25516 is a partial assignment of a state filing for diversion from Kellogg Creek. Application 25516 includes a storage component of 10,800 af/yr at the Los Vaqueros Reservoir site and 14,800 af/yr at the Kellogg Reservoir site. In addition, application 25516 includes a small direct diversion component from Kellogg Creek.

Although CCWD had determined which alternatives would be addressed in its EIR/EIS for the Los Vaqueros Project, CCWD filed these water rights applications with SWRCB before completing its extensive alternatives analysis and before it completed the draft Stage 2 EIR/EIS. The water right application process provides the ability to reduce the quantities and rates of water diversion but does not allow the rate to be increased without refiling the application.

To ensure that feasible alternatives were not eliminated and to minimize potential schedule delays caused by the need to refile an application if changes in the project occurred, CCWD intentionally filed applications for larger quantities of water and greater rates of diversion than its projected need. The Stage 2 EIR/EIS, however, only analyzes, and provides environmental documentation for, alternatives consistent with CCWD's identified water quality and reliability objectives.

The water rights applications will be reduced to be consistent with CCWD's staff-preferred alternative identified in the Stage 2 EIR/EIS. Making the water rights applications consistent with CCWD's proposed action that was addressed in the Stage 2 EIR/EIS will involve reducing the quantity of water that can be diverted to storage to 100,000 af reducing the diversion rate at the new supplemental intake from 600 cfs to 250 cfs, and eliminating the Kellogg Reservoir site from the water rights application.

CCWD has not provided adequate environmental documentation under either CEQA or NEPA to construct or operate a project other than that considered in the Stage 2 EIR/EIS. In addition, CCWD's draft amended water service contract with Reclamation specifically states that "in utilizing its CVP water supply in conjunction with its Los Vaqueros water rights water, the District shall not deliver within its existing service area, in any one year, a quantity of water in excess of 195,000 acre-feet."

Therefore, the total amount of water available for use within CCWD's service area under both Los Vaqueros water rights and through CCWD's contract with Reclamation is 195,000 af.

5-2. CCWD's identified demands are 188,000 af/yr in critical years and 174,600 af/yr in noncritical years. The referenced statement indicates that there are variables that could affect CCWD's demands in any single year. CCWD and Reclamation believe that additional model runs are not necessary for two reasons. First, events that could lead to CCWD exceeding its projected demands are impossible to predict but would occur only infrequently, if at all. It is important to note that in critical years, a substantial portion of CCWD's demands consist of industrial diversions that normally occur directly from the San Joaquin River unless water quality in the river is extremely poor. These demands are difficult to precisely project.

In addition, modeling these demands would not provide substantial additional information. Changes in diversions of approximately 9,000 af/yr would not measurably alter flows or salinities in the Delta or flows upstream when diversions from the Delta total nearly 6 million af/yr.

5-3. See response to comment 5-2 above.

5-4. Comment noted. The maximum diversion rate of the proposed Old River intake is 250 cfs. This correction has been made in the final Stage 2 EIR/EIS. See also response to comment 5-1 above.

5-5. Comment noted. CCWD and Reclamation recognize that the SWRCB has these additional responsibilities.

5-6. The proposed operation of the project in dry and critical years would require the use of an additional 26,000 af for water quality blending. CCWD would reduce its diversions from the Delta by an equivalent amount to meet its water quality objectives and therefore, the proposed project would not result in increased water supplies. See also response to comment 5-1 above.

5-7. See response to comment 5-4 above.

5-8. The demand levels used reasonable estimates of current demands and the analysis and conclusions are appropriate. The demands used in the operations studies were selected as representative of current demands. Actual exports are often less than demands, especially in drought conditions. Thus, it would not be expected that actual average annual export levels of the CVP and SWP (which have increased over the last 10 years) would be as high as reasonable estimates of current demand levels. In these studies, export levels fell below demand levels in drought periods and were not overestimated.

5-9. As described throughout Chapter 4 of the EIR/EIS, "Delta System Fisheries Resources", most impacts associated with the proposed project are extremely minor and are therefore considered less than significant in terms of the project's direct impacts on fishery resources. Whenever the proposed project would result in slight additional incremental impacts under future conditions, however, the Stage 2 EIR/EIS identifies these impacts as contributing to significant cumulative impacts.

5-10. The analysis in the EIR/EIS indicates that reverse flows would be less frequent than under existing conditions. This reduction would benefit Delta smelt.

Total diversions from the Delta in April would be reduced under future conditions according to model simulations in the EIR/EIS because upstream reservoir storage would be reduced and the frequency of years when there would be water available for diversion in April would also be reduced.

5-11. The intent of the last two sentences in the referenced section are to indicate that, to the extent that there would be any effects, they would occur primarily in those portions of the Bay system closest to the Delta because the extremely small magnitude of the changes would be unmeasurable farther intc the Bay system, and any effects would be very minor because the proportional reduction in Delta outflow is minor.

5-12. CCWD and Reclamation believe that the comparison of the proposed project to the No-Action Alternative is appropriate for purposes of CEQA and NEPA compliance. The proposed project would not greatly increase CCWD's ability to deliver water from the Delta to its service area. Although the proposed project would eliminate the need to make improvements to a portion of CCWD's water conveyance system, major restrictions would still exist in the Contra Costa Canal system that would limit CCWD's deliveries to approximately existing conditions. Improvements necessary to increase CCWD's ability to deliver water to its service area under any of the alternatives are described on pages 2-2 through 2-4 of the EIR/EIS.

In addition, the paragraph following the referenced paragraph does in fact identify the impact as a significant cumulative impact.

5-13. See responses to comments 5-2 and 5-12 above. CCWD believes that the modeling it has conducted to determine impacts on striped bass is appropriate, particularly because CCWD diversions would be substantially reduced in fall of most years because CCWD would be relying on water stored in the Los Vaqueros Reservoir. Increases in impacts on striped bass are generally identified as significant in the EIR/EIS.

5-14. See responses to comments 5-12 and 5-13 above. CCWD is working directly and closely with the California Department of Fish and Game and the National Marine Fisheries Service regarding fish screen design. CCWD is designing the fish screen to meet the criteria identified by these agencies. Losses to entrainment under the project alternatives are compared to both existing conditions and to the No-Action Alternative.

5-15. CCWD believes, based on available information, that there is no indication that the minor reductions in Delta outflow caused by the project would contribute to cumulative impacts on fisheries in San Francisco Bay. In addition, under the No-Action Alternative, reductions in Delta outflow were determined to have a less-than-significant effect.

5-16. See responses to comments 5-1 through 5-15.

5-17. As a result of comments received on the draft EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project, particularly for winter-run chinook salmon. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta during the winter-run chinook salmon's season of highest vulnerability. This operation will allow CCWD to eliminate all its diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species.

5-18. See response to comment 5-17, above.

5-19. The Stage 2 EIR/EIS fully discloses the expected impacts of recreation in the Kellogg Creek watershed from recreational development. As noted on page 7-18, impacts on botanical resources are not expected because the project description incorporates management guidelines that state that impacts on botanical resources shall be avoided, the adopted conceptual recreation plan includes provisions to protect botanical resources, and recreation use will be monitored by CCWD. The potential effects of the recreation plan on other resources and issues, including traffic, air quality, and cultural resources, are also fully analyzed in the EIR/EIS. The Stage 2 EIR/EIS recognizes, however, that the conceptual recreation plan may change before it is implemented. If changes occur, CCWD will, as lead agency, develop a final recreation plan, prepare appropriate documentation under CEQA and recommend appropriate mitigation measures.

5-20. Only mitigation measure 7-1 identifies that additional surveys may be required. This mitigation measure has been proposed by CCWD because, as indicated on page 7-35, very small portions

(about 20 acres) of the project area (over 20,000 acres) have not yet been surveyed because of lack of property access. This mitigation measure requires surveys and wetland delineations if project features are proposed in any areas that have not yet been surveyed. The final paragraph of the mitigation measure identifies specific actions that will be required if sensitive botanical resources are found.

5-21. CCWD believes that the mitigation measures developed and included in the Stage 2 EIR/EIS are adequate. In addition, more detailed information regarding the proposed wetland mitigation plan and valley oak woodland plan have been developed and are included as appendices to the final EIR/EIS. The valley oak woodland mitigation plan contains measures, such as establishing bird boxes and brush piles, to partially offset losses of short-term wildlife habitat.

5-22. See response to comment 5-21 above.

5-23. Valley oaks were avoided where practicable during project planning. However, some could not be avoided because they are within the reservoir inundation zone. The Stage 2 EIR/EIS identifies the loss of approximately 180 acres of valley oak woodlands as a significant impact on a significant natural vegetation community and proposes mitigation measures to reduce this impact to a less-than-significant level. Although valley oak woodlands are considered a significant natural community, the stand of valley oaks in the Kellogg Creek watershed does not support particularly unique wildlife values when viewed in the context of adjacent areas controlled by CCWD that provide equivalent habitat values. Therefore, loss of these woodlands would have a less-than-significant impact on area wildlife. In addition, CCWD believes that it is unimportant in which section of the EIR/EIS the impact is identified as significant. The impact is considered significant and mitigation measures have been proposed by CCWD.

5-24. Descriptions of watershed management have been expanded in the biological assessment and incorporated into the biological opinion for terrestrial species.

5-25. Comment noted. This correction has been included in the final EIR/EIS.

5-26. Chapter 11 of the final EIR/EIS contains a description of activities conducted in compliance with Section 106 of the National Historic Preservation Act since publication of the draft EIR/EIS. Attachment 3 includes a letter from the State Historic Preservation Officer (SHPO) expressing concurrence with these findings.

CCWD, Reclamation, the Corps, the SWRCB, and the SHPO have developed and executed a programmatic memorandum of agreement (PA) that will determine how mitigation will be conducted for properties eligible for listing in the National Register of Historic Places. The PA is also included in Attachment 3.

5-27. At the time the draft EIR/EIS was published, an area of potential effect (APE) had not yet been firmly established. Since publication of the draft EIR/EIS, substantial progress has been made in complying with Section 106. This progress is discussed in Chapter 11 of the final EIR/EIS.

5-28. Comment noted. This correction has been included in the final EIR/EIS.

5-29. The section discussed in this comment was written to generally describe potential impact mechanisms, not to describe impacts. Impacts of reservoir operation under the proposed action are described on page 11-11 of the EIR/EIS.

5-30. Comment noted. As described in response to comment 5-27, above, substantial progress has been made in complying with Section 106 since publication of the draft EIR/EIS. This progress is discussed in Chapter 11 of the final EIR/EIS.

5-31. CCWD and Reclamation recognize that prehistoric and historic sites within the project APE will be affected by the recreation facilities and will treat these sites as appropriate pursuant to the PA.

5-32. Comment noted. As described in response to comment 5-27, above, substantial progress has been made in complying with Section 106 since publication of the draft EIR/EIS. This progress is discussed in Chapter 11 of the final EIR/EIS. The possibility of buried sites and the steps necessary to comply with Section 106 are included in the PA.

5-33. See response to comment 5-27, above.

5-34. The Stage 2 EIR/EIS clearly recognizes on page 11-20 that avoidance is the preferred mitigation measure. The fencing measure discussed on page 11-21 is specifically aimed toward preventing incidental impacts from construction activities and would be a short-term measure that would allow construction monitors to clearly delineate to construction crews areas to avoid. CCWD and Reclamation recognize that compliance with Section 106 is necessary before receiving permits from certain state and federal agencies and has proceeded with studies based on that knowledge. The process is described on page 11-21.

5-35. The intent of the mitigation measures is to reduce the impacts caused by the proposed action to a less-than-significant level. CCWD and Reclamation recognize that these measures will not ensure protection from all possible non-project-related impacts but believe that the measures described in the EIR/EIS are appropriate and will reduce impacts to less-than-significant levels.

5-36. Compliance with Section 106 is described in Chapter 11 of the final EIR/EIS.

5-37. The information discussed in this comment was developed by CCWD and was provided to the SWRCB staff for use as part of the water right hearings for the Los Vaqueros Project.

5-38. The mitigation measure referenced in this comment does not rely on site evaluation as mitigation. Site evaluation is coupled with data recovery if the sites were determined to be eligible for listing in the NRHP.

All references to "OHP" have been changed to "SHPO" in the final EIR/EIS.

5-39. See responses to comments 5-20, 5-21, 5-23, and 5-24 above.

5-40. CCWD believes that the cumulative impact analysis is appropriate. Implementation of the PA will result in a finding of no adverse effect and the Los Vaqueros Project would therefore not contribute to significant cumulative impacts.

5-41. CCWD believes that the measures proposed to mitigate vegetation and wildlife impacts throughout the Stage 2 EIR/EIS as supplemented in the biological assessment are adequate to mitigate impacts to less-than-significant levels. CCWD has worked closely with resource agencies responsible for approving aspects of the proposed project and believes that these issues have been adequately addressed.

5-42. CCWD believes that the mitigation program it has developed is adequate to reduce impacts to less-than-significant levels. This program is fully described in the final EIR/EIS. In addition, as part of the approval process for the proposed project, CCWD will adopt a mitigation monitoring and reporting plan consistent with CEQA. See also responses to comments 5-25 through 5-38.

5-43. See response to comment 5-42 above. CCWD believes that the environmental documentation it has developed for the Los Vaqueros Project provides an appropriate basis for responsible agencies to make permitting decisions, and no additional environmental documentation is planned.

5-44. Comment noted.

5-45. Native American coordination and consultation has been conducted by CCWD and Reclamation to elicit opinions concerning the entire Los Vaqueros Project, including the reinterment of human remains.

SHPO's written concurrence with Reclamation's determination of eligibility and determination of effect has been received and is included in the final EIR/EIS. In part, the letter concurs that with implementation of the PA, the project will have no adverse effect.

LETTER NO. 6

STATE OF CALIFORNIA—THE RESOURCES AGENCY
~~GEORGE DEUKMEJIAN~~, Governor

DEPARTMENT OF FISH AND GAME
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

CCN 17876
EN 13.2.9.5

June 1, 1992

CC: JSG
JH
HG
WHB

Mr. John S. Gregg
Program Manager
Los Vaqueros Project
Post Office Box 4121
Concord, California 94524

Dear Mr. Gregg:

Draft Stage 2 Environmental Impact Report/
Environmental Impact Statement (EIR/EIS)
Los Vaqueros Project

Department of Fish and Game personnel from the Department's Region 3 office have reviewed the subject document which evaluates the construction of a 100,000-acre foot storage reservoir on Kellogg Creek in eastern Contra Costa County. Our comments relate only to project impacts associated with the reservoir site since the point of diversion for the reservoir is in the Department's Region 2. Time and personnel constraints have limited our review of the document. Concerns regarding the project's effects on Delta and Sacramento/San Joaquin River fishery resources were incorporated into the Department's comments to the State Water Resources Control Board on Water Applications 20245, 25526, and Permit Application 5626, et al.

Department staff have been working with the Contra Costa Water District and its consultant for several years to address impacts associated with the proposed reservoir and associated realignment of Vasco Road and various utility corridors. We have provided comments on previous California Environmental Quality Act documents (Stage 1 EIR and Vasco Road Realignment EIR). In a letter dated January 14, 1992, we provided comments to the District on the Stage 2 Administrative Draft. The comments included in that letter should be addressed in the final document. 6-1

Based upon our review of the document, we believe that it provides an adequate assessment of impacts associated with the proposed project and the various project alternatives (i.e., Desalinization, Kellogg Reservoir, Middle River Intake/EBMUD Emergency Supply, and No Project) on terrestrial and aquatic resources within Region 3 (Contra Costa County west of Highway 4). The proposed reservoir, while incurring impacts to wetlands, oak woodlands, grasslands, and several sensitive plant and animal species, also provides substantial benefits to wildlife through watershed acquisition and proposed mitigation measures. 6-2

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Of prime concern to the Department are negative effects on wildlife which would be associated with recreational development of the reservoir. No discussion of these impacts is incorporated in the DEIR. Placement of these facilities, along with other facilities required for operation and maintenance of the reservoir, could significantly affect wildlife use of the affected areas, as well as mitigation sites if in close proximity to such facilities. Of particular concern and not discussed in the document are the effects of these facilities on species such as the San Joaquin kit fox. An example is the effect of proposed facilities along the southwestern shore of the Los Vaqueros Reservoir and their effect on kit fox movement from the eastern side of the reservoir to the west and to the Round Valley area. The effect of habitat fragmentation resulting from the reservoir and associated facilities should be addressed to allow a complete assessment of the effects of the project on these species and other wildlife. 6-3

The issue of what is appropriate mitigation for kit fox impacts associated with the reservoir is not specifically addressed in the document. The Department believes that watershed acquisition will offset impacts associated with the reservoir itself but not the effects of the realigned Vasco Road. We recommend acquisition of habitat within the Herdlyn area as the appropriate method of addressing these effects. This recommendation is based on the fact that the road affects habitat which is known to be occupied by the species (based on sightings). The road also will introduce a new obstacle to kit fox movement in a previously undisturbed setting. The Herdlyn area is a known use area for kit fox and is in close proximity to a recently documented occurrence to the north. While a large portion of the reservoir acquisition area is suitable kit fox habitat, no actual observations of the species in the area were made during project surveys. 6-4

The Department concurs with proposed mitigation measures for wetland and valley oak woodland impacts. Specific mitigation plans should be incorporated in the final document. 6-5

The Department is concerned that the document does not provide specific measures to address impacts to California tiger salamanders, red-legged frogs, and western pond turtles. Unspecific proposals to relocate turtles and frogs from impact areas are not adequate to assure that significant impacts are offset. Of specific concern is whether or not suitable relocation sites are available or can be recreated. Also, it will be necessary to incorporate management measures into any mitigation plan for these species to assure that suitable conditions are maintained at mitigation sites and relocation sites to assure that the species can become established and maintain themselves. This includes a predator-control program to assure that bullfrogs and predatory fish are excluded from mitigation sites. 6-6

In the case of the tiger salamander, we are concerned that specific mitigation plans be provided. The DEIR indicates that culverts and fencing will be used to provide passage between denning sites and breeding habitat separated by Vasco Road. The document should provide evidence that such 6-7

mitigation is effective and feasible. It may be more effective to construct new breeding habitat in proximity to the denning habitat isolated by road construction. A more detailed discussion of this issue is needed in the DEIR.

While the inundation zone of the reservoir will not affect the Alameda whipsnake, the document does not provide an adequate discussion of potential impacts associated with utility relocations, proposed recreational facilities, and fire management activities. Potential negative effects to this species, as well as measures to avoid or offset impacts should be included in the document. 6-8

In the discussion of impacts associated with the desalinization alternative, the document identifies the State-listed rare Mason's lilaeopsis and threatened California black rail as potentially being affected. The document provides no information on whether surveys were conducted to determine if these species would be affected by the project. The brine discharge pipeline would traverse brackish marsh bordering Suisun Bay which is suitable habitat for these species. Potential impacts and mitigation measures should be discussed in the DEIR. 6-9

We appreciate the opportunity to provide these comments. Comments concerning impacts associated with the diversion points and on fisheries will be provided in a separate letter. Questions concerning our comments should be directed to Carl Wilcox, Environmental Services Supervisor, 707-944-5525.

Sincerely

Brian Hunter
Regional Manager
Region 3

cc: Ms. Laurie Simmons/Mr. Mark Littlefield
U. S. Fish and Wildlife Service

Mr. Tom Coe, Corps of Engineer

National Marine Fisheries Service

Environmental Protection Agency

6-1. Comment noted. CCWD appreciates the excellent working relationship it has developed with the California Department of Fish and Game and the willingness of the department to provide early input and comment in the environmental documentation process for the Los Vaqueros Project.

6-2. Comment noted.

6-3. Comment noted. The conceptual recreation plan contains substantive provisions to minimize impacts on wildlife species. The provisions are included in Section A-2 of the Stage 2 EIR/EIS Technical Report. The biological assessment, sent to the USFWS June 1, 1992, analyzes the effects of proposed recreational facilities on the San Joaquin kit fox and other wildlife species and includes an analysis of the effects of habitat fragmentation resulting from the reservoir and associated recreation facilities, specifically on the southwestern shore of the Los Vaqueros Reservoir. The biological opinion is summarized in Chapter 20, "Consultation and Coordination". CCWD also expects to enter into an agreement with DFG, which will provide for minimization of and compensation for all kit fox impacts, in accordance with Fish and Game Code Section 2081.

6-4. The biological assessment includes a detailed analysis of the effects on kit fox from direct habitat loss, habitat fragmentation, increased mortality, and reduction in adjacent habitat quality from the relocated Vasco Road. CCWD has agreed to purchase approximately 1,000 acres of mitigation lands outside the Kellogg Creek watershed, including lands in the Herdlyn watershed area to compensate for habitat loss along relocated Vasco Road.

6-5. Comment noted. Specific mitigation plans for these resources are included as appendices to the final Stage 2 EIR/EIS.

6-6. CCWD intends to fully mitigate project impacts on California red-legged frogs, California tiger salamanders, and western pond turtles. The biological assessment contains an analysis of these three species with measures designed to avoid, minimize, and compensate for impacts. In addition to the biological assessment, CCWD has prepared a mitigation plan that includes specific relocation sites (both existing and created) and management plans that incorporate the individual species needs for water, vegetation, upland habitat, and a predator-free environment.

6-7. The issue of culverts, fencing, and replacement habitat for California tiger salamanders is addressed in the biological assessment. Mitigation for tiger salamanders along relocated Vasco Road will be combined with pond creation, enhancement, and undercrossings, with some type of structure to direct salamanders away from the road and to the undercrossings. CCWD has consulted with John Brode of the California Department of Fish and Game to design a suitable "fencing-type" design to direct salamanders to culverts. If implementation of this measure is impractical, CCWD will consider constructing new breeding habitat in consultation with Mr. Brode. See response to comment 6-6.

6-8. The biological assessment analyzes impacts on the Alameda whipsnake from the proposed project, including recreational and fire management activities. All utility relocation alignments are outside Alameda whipsnake habitat. The biological assessment and Stage 2 EIR/EIS include measures to ensure that recreational impacts and fire management activities do not adversely affect the Alameda whipsnake.

6-9. Comment noted. Surveys were conducted for California black and clapper rails during May 1991 in the brackish marsh bordering Suisun Bay. Although no rails responded to the taped calls, the brackish marsh is considered suitable habitat for California black rails based on records of nearby occurrences. Impacts are presented in the Stage 2 EIR/EIS on pages 8-36 and 8-38, and mitigation measures are presented on page 8-46.

SENT BY:DWR CONSTRUCTION OFFIC; 5-12-92 2:31PM ; 9166530993→ LETTER NO. 7

State of California CCN 17741 EN 13.2.9.5 The Resources Agency

Memorandum

Date : MAY 11 1992

cc: JS6 6 lines Hutton WHB

To : A-38
Carol Whiteside
Assistant Secretary
Intergovernmental Relations
The Resources Agency
1416 Ninth Street
Sacramento, California 95814

From : Department of Water Resources

Subject: Comments on DEIR/DEIS, Los Vaqueros Project Stage 2 SCH 91063072

Fisheries Impacts

The DEIR/DEIS does identify many of the complex Delta fisheries issues interrelated to the Central Valley Project, State Water Project and Contra Costa Water District. The major parameters that are commonly studied in connection with these fisheries issues are presented and evaluated. However, no information was found on:

a. The present total number of fish impacted at the unscreened CCWD Delta diversion at Rock Slough.

b. The projected numbers of fish impacted for the added diversions at Rock Slough or the proposed new intake for Los Vaqueros. 7-1

Various productive ideas about participation in ongoing mitigation activities were discussed. Our review was unable to identify a specific commitment to a mitigation plan. Independent of other mitigation activities, CCWD should show a mitigation program for direct impacts at the present and future Delta intakes.

An important and urgent aspect of mitigation involves winter-run salmon, and potentially Delta smelt. Monitoring and identification of specific impacts to these fish should be identified with reasonable and prudent alternatives.

Land and Right-of-Way

It appears that the DEIR/DEIS does not discuss the coordination necessary related to alignment of the Los Vaqueros Project preferred alternative intake location on Old River and alternative locations of the enlarged SWP Clifton Court Forebay outlined in the South Delta Water Management Program DEIR/DEIS released by the Department of Water Resources in June 1990. The Los Vaqueros DEIR/DEIS should state that such coordination has taken place, and will continue, between the CCWD and DWR. 7-2

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Safety of Dams

Los Vaqueros Dam and its alternative Kellogg Dam fall under the jurisdiction of DWR's Division of Safety of Dams. The applicant must secure an approved application from this Division prior to commencement of construction. The Division will supervise the construction of the dam and, upon satisfactory completion, will issue a Certificate of Approval to impound water.

The DEIR/DEIS includes a general, but clear statement that covers the Division's review and approval prior to start of construction. The general description provided in the DEIR/DEIS for the proposed project is adequate. Detailed design features will be addressed and resolved in our review of the construction plans and specifications for Los Vaqueros Dam as part of our application process.

Delta Modeling

1. It is difficult to understand what operation studies are applied to a given alternative. This should be made more clear. A table showing which operation studies were used for each alternative would be useful.

2. Page 3-7. Fischer Delta Model results for flow in the Delta Cross Channel, Georgiana Slough, and the San Joaquin River at Twitchell Island are used to evaluate flow conditions in the Delta.

   Our flow-split analysis shows that FDM consistently predicts higher cross transfer flow compared to the standard flow split relation determined by multiple tidal cycle flow measurements. FDM output have a higher intercept and larger slope resulting in predictions of cross transfer flow 500 to 1000 cfs greater than the accepted relation. To the extent that FDM over predicts cross transfer flow, it also implies that too much carriage water is released because reverse flow will be reduced by a like amount.

   Net flow at Twitchell Island is not obtained directly from FDM. Instead, it is calculated by subtracting simulated net flow through Threemile Slough from simulated net flow at Jersey Point. The resulting net flow is used to assess impacts on fisheries. Why the analysis does not simply use the simulated net flow from San Joaquin River at Twitchell Island is not clear.

3. Page 5-9. Impact Screening Criteria #2: At D-1485 water quality stations, FDM model results are flagged when base salinity results are greater than 95 percent of the D-1485 standard, and the alternative causes any increase in salinity levels. The purpose of this approach is to screen water quality changes caused by the project that could impact standards. However, this is not an incremental use of the model. The 95 percent criteria is determined by the model in the first place. This suggests that the model is very accurate in an absolute sense (rather than incremental) and can predict conditions under which small differences from the standard occur. 7-7

   The approach implies that impacts on water quality below 95 percent of the standard are not significant, which may not be the case.

Statewide Modeling

1. It appears that Los Vaqueros Reservoir was not actually modeled in the DWRSIM planning simulation model. Instead, results from three DWRSIM studies are presented to show three different levels of future development, all of which include a fixed CCWD Delta diversion. This fixed CCWD diversion appears to include water for Los Vaqueros although that is not clearly stated in the study assumptions (Technical Report, Section B-2). The assumptions should clarify what operation is assumed in the CCWD diversion amounts listed (is Los Vaqueros operation included or not?). 7-8

   To properly evaluate impacts of Los Vaqueros Reservoir on the CVP and SWP systems, each of the three DWRSIM studies (A7, 543 and 476) should have been simulated twice; first without Los Vaqueros Reservoir in operation and second with Los Vaqueros added. The impacts on SWP and CVP operations can only be correctly modeled and evaluated using this incremental approach. Thus we recommend that the DEIR contain DWRSIM study results from both "with" and "without" Los Vaqueros scenarios at each of the three levels of development (a total of six DWRSIM studies).

2. The DEIR/DEIS section on project operations (page 2-5) states that water could be diverted from the Delta to fill Los Vaqueros storage between the months of November through June. We suggest that export pumping be curtailed to non-project levels in the months of May and June, in order to comply with SWRCB D-1485 criteria for striped bass survival. According to D-1485 criteria, total CVP and SWP Delta diversions are limited to a combined total of 6,000 cfs in the months of May and June. Thus, any increase in Delta exports above these existing limits would appear to aggravate the impacts on striped bass. 7-9

3. In the DEIR/DEIS Technical Report (page B-31), the title for Section B should clearly state that the following Section B assumptions are for CCWD's simulations using the DWRSIM model. The title on page B-31 gives a false impression that the following studies were run by DWR, which is not the case. A better title might be: "CCWD Planning Simulation Model Assumptions For Los Vaqueros Project Studies Using The DWRSIM Model". 7-10

E. F. Huntley

Edward F. Huntley, Chief
Division of Planning
CALNET 453-1099

7-1. As a result of comments received on the draft EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project, particularly for winter-run chinook salmon. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta during the winter-run chinook salmon's season of vulnerability. This operation will allow CCWD to eliminate all diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species.

7-2. CCWD and the California Department of Water Resources (DWR) have coordinated extensively regarding the location of proposed DWR and CCWD facilities. CCWD believes that the two agencies have developed a good working relationship and intends to continue coordination efforts in the future as necessary.

7-3. Comment noted. CCWD recognizes DWR's responsibilities relating to safety of dams and has coordinated extensively with staff of DWR's Division of Safety of Dams to submit the necessary documentation to DWR's Division of Safety of Dams as project planning proceeds.

7-4. A description of how modeling was conducted for the Los Vaqueros Project is included on pages 1-10 through 1-12 of the EIR/EIS. This discussion includes a description of which DWRSIM model runs were used to analyze the alternatives under existing, future, and future cumulative conditions. It is important to note that CCWD used the same DWRSIM model runs to analyze the alternatives under each condition. Only CCWD demands under the various alternatives were changed.

7-5. The comment assumes that the accepted flow split relation accurately represents measured flow data. The relationships are described in DWR's DAYFLOW documentation (February 1986, pages 17-19). The relationships were developed in 1978 (page 18) but were based only on measurements made prior to the time State Water Project exports began (DWR, "Biological Assessment, Effects of Central Valley Project and State Water Project Delta Operations on Winter-Run Chinook Salmon", October 1992, pages 47-48). Measurements made by DWR after 1970, which show significantly higher flows, were not included in the analysis. The DWR relationships indicate that for a range of flows, partially closing the cross-channel will increase flow through the two channels: this is counter-intuitive and contradicted by field measurements.

In 1982, the late Professor Hugo B. Fischer of the University of California performed an independent analysis of all the data and found relationships that yield higher estimates of the cross-transfer flow than DWR's relationships.

The figures presented at the end of responses to comments of DWR show the measured data and results from the Fischer Delta Model (FDM). The FDM data were generated using the 19-year mean tide. The figures include flow measurements made by DWR in 1990 which again are higher than the data used in the DWR's 1978 analysis.

The figures show DWR's relationship is inconsistent with recent measurements. The FDM provides an appropriate representation of the measured data.

7-6. The methodology used provides the flow in the San Joaquin River past Twitchell Island plus the flow through False River. This provides a better estimate of the flows important for the fisheries impact analysis than simply the flow past Twitchell Island. The same result can be obtained by directly adding the modeled flow past Twitchell Island with the modeled flow through False River.

7-7. The approach used to analyze water quality impacts in the EIR/EIS does not indicate that impacts on water quality below 95% of D-1485 standards are less than significant. All potential impacts when salinity is below 95% of D-1485 standards are flagged by criterion 1.

Criterion 1 flags all changes greater than 5% of the base if the changes are also greater than 5 mg/l chloride or 20 micromhos per centimeters electrical conductance. Criterion 1 alone would indicate that some increases in salinity that approach or exceed D-1485 standards are not significant. Criterion 2 was developed so that the latter cases would be included in the analysis as well. The 95% level is derived from the 5% accuracy limit used in criterion 1.

In summary, when the modeled salinity was less than 95% of a standard, it was flagged if the change was at least 5% (and greater than 5 mg/l or 20 μmhos/cm); if it was greater than 95% of a standard, any increase was flagged.

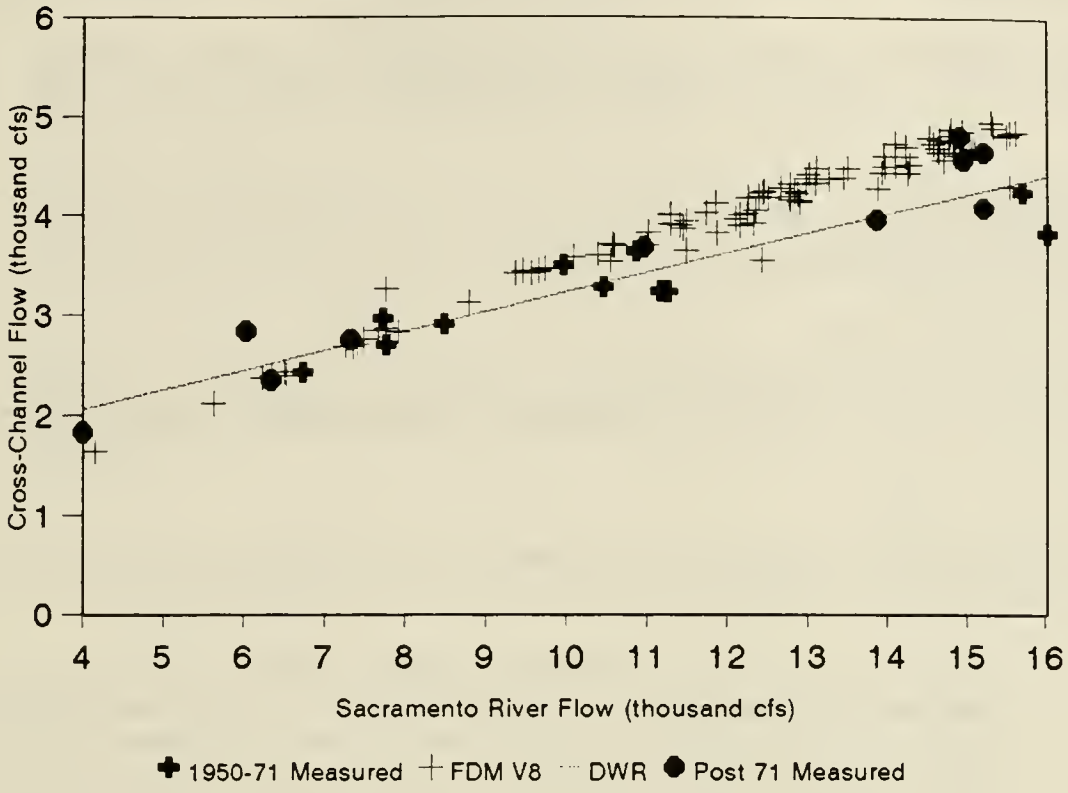
7-8. The Los Vaqueros Project was modeled with the DWRSIM planning simulation model. Model simulations included cases with and without the project alternatives. Results are summarized in the Stage 2 EIR/EIS Technical Report, Section B-1, where the tables show results with and without project alternatives and the differences resulting from the alternatives. Additional information regarding the effects of CCWD's revised operations are included in the biological assessment and in Attachment 2 to the final EIR/EIS.

The future cumulative case was not run with the project for the reasons discussed in Chapters 3 and 5 of the EIR/EIS. The uncertainty in the North and South Delta Management Program alternatives, as well as the Los Banos Grandes project, do not allow a detailed analysis of that case. The approximate analysis performed is the appropriate level of detail considering the uncertainty in the configuration on many of these possible projects.

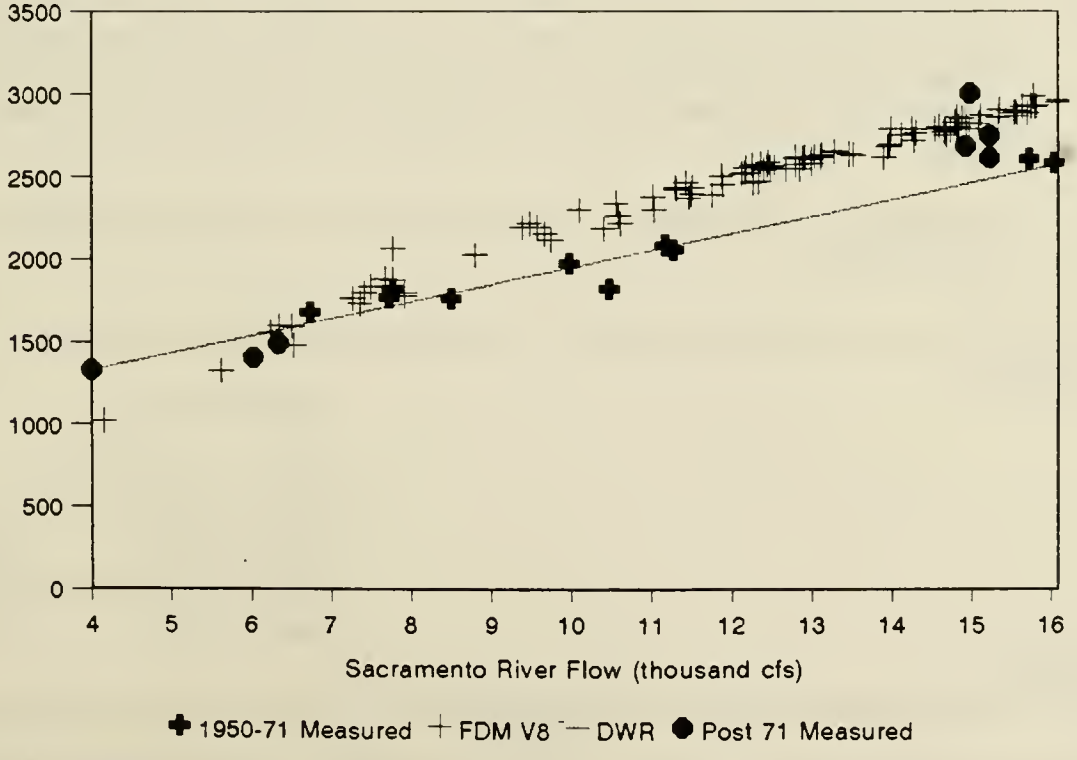
7-9. See response to comment 7-1.

7-10. Comment noted. However, it should be noted that, although CCWD ran these simulation studies again, the only minor change made was to alter CCWD's demands. Therefore, the assumptions described in Section B-2 accurately reflect the assumptions originally included in the referenced DWRSIM model runs.

Delta Cross-Channel Flow
Measured and Fischer Model



Georgiana Slough Flow
Measured and Fischer Model



LETTER NO. 8

Contra Costa County

CCN 17749
EN 13.2.9.5

Public Works Department

255 Glacier Drive
Martinez, California 94553-4897
FAX: (510) 313-2333
Telephone: (510) 313-2000

J. Michael Walford
Public Works Director

Milton F. Kubicek
Deputy Director

Maunce E. Mitchell
Deputy Director

May 12, 1992

John Gregg
Program Manager
Contra Costa Water District
P.O. Box 4121
Concord, CA 94525

RE: Draft Stage 2 Environmental Impact Report for Los Vaqueros

Dear Mr. Gregg:

The Public Works Department has reviewed the Draft Stage 2 Environmental Impact Report for the Los Vaqueros Project and has the following comments:

1. Section A-3 of the Technical Report, entitled Detailed Construction Information, describes the transport of construction materials and heavy equipment to and from Los Vaqueros Reservoir, the transfer reservoir, and the transfer reservoir pumping plant. Please include a discussion of the impacts these transport trucks will have on the structural pavement section of roads in Contra Costa County, that will be used for transport, over the two to three year construction period. Also, include a discussion of the mitigations needed, such as pavement repair and maintenance, for construction truck impacts on these roads. 8-1

2. The average daily truck traffic described in the Technical Report should also be discussed and presented in Chapter 13 of the DEIR. Truck traffic generation and distribution should be displayed in figures. The offsite sources of construction material, along with their associated transport routes, should also be displayed in figures. 8-2

3. The impacts and mitigations of recreational traffic should be discussed in Chapter 13 of this DEIR. 8-3

If you have any questions regarding these comments, please contact me at (510) 313-2382.

Very truly yours,

Lowell Tunison
Senior Civil Engineer
Major Projects

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LT:TR:peo
c:Gregg.t6
cc: M. Shiu, Road Engineering 5-92

8-1. Chapter 16 of the EIR/EIS, "Public Services", includes discussion of project-related truck traffic effects on local roadways and recommends mitigation measures for significant impacts. Discussions of these items are found on pages 16-10 and 16-16 through 16-19.

8-2. Because of the large size of the project area and the number of local, regional, and institutional issues related to the project, CCWD, its consultants, and Reclamation spent considerable effort attempting to maintain NEPA recommendations on the size of the document. This effort included moving much of the background and technical information, including the information requested in this comment, from the EIR/EIS into the technical report.

8-3. Chapter 13, "Transportation", discusses the impacts of recreation traffic on level of service and traffic volumes. The effects of recreation plan traffic on the maintenance of local roadways did not meet the significance criteria outlined on page 16-9 and therefore were found to be less than significant.

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EN 13.2.9.5

LETTER NO. 9

EAST BAY
MUNICIPAL UTILITY DISTRICT

JORGE CARRASCO
GENERAL MANAGER

CC. GWD
JH
HG
WHB

May 13, 1992

Mr. William J. Woska
Acting General Manager
Contra Costa Water District
P.O. Box H20
Concord, CA 94524

Dear ~~Mr. Woska~~ Bill:

At a workshop on April 21, EBMUD's Board of Directors selected six composite programs for detailed evaluation in the EIS/EIR for the District's Water Supply Management Program (WSMP). None of the selected programs include a joint CCWD/EBMUD Los Vaqueros project. In selecting the six primary composite programs, the Board concluded that there are alternatives available to EBMUD that are preferable to Los Vaqueros participation with respect to cost, water quality and environmental impacts. Although it was recognized that a substantial delay in implementation of the Los Vaqueros Project would occur if it became a joint CCWD/EBMUD project, this was not a primary factor in the decision.

The analyses of potential joint projects completed to date will be reflected in the District's Draft EIS/EIR, scheduled for release in November 1992.

EBMUD staff have reviewed CCWD's Draft Stage 2 EIS/EIR for the Los Vaqueros Project. In reviewing this document, one EBMUD-related issue that should be addressed in the final Los Vaqueros EIS/EIR was identified: In discussing a possible connection to EBMUD's water supply, the Los Vaqueros Draft EIS/EIR indicates that EBMUD's Mokelumne Aqueducts are vulnerable to seismic damage. It should be noted that the EBMUD Board of Directors has decided to strengthen the Mokelumne Aqueducts against earthquakes and Delta flooding as part of the WSMP. 9-1

We appreciate your assistance in providing us with information required to evaluate the joint Los Vaqueros project. If you have any questions, please contact John Lampe, Manager of Water Planning, at 287-1127.

Sincerely,

Jorge

Jorge Carrasco

cc: EBMUD Board of Directors
✓John S. Gregg, Program Manager, Los Vaqueros Project

JC:MKG:tl

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MAY 18

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . (510) 287-0101

BOARD OF DIRECTORS NANCY J. NADEL . KENNETH H. SIMMONS . ANDREW COHEN
JOHN A. COLEMAN . STUART FLASHMAN . JOHN M. GIOIA . KATHERINE McKENNEY

LOSVAQ 05/07/92

9-1. Comment noted. CCWD is aware of East Bay Municipal Utility District's decision to strengthen the Mokelumne Aqueduct. The aqueduct would, however, remain substantially more vulnerable to damage than the Los Vaqueros Reservoir. In addition, it remains unlikely that the East Bay Municipal Utility District could provide sufficient water to meet CCWD's emergency supply needs.

LETTER NO. 10

6 lines Blacken JSG

Delta Diablo Sanitation District

OFFICE AND TREATMENT PLANT: 2500 PITTSBURG-ANTIOCH HIGHWAY: ANTIOCH, CA 94509
ADMIN FAX: (415) 778-8513 TELEPHONE: (415) 778-4040 MAINT. FAX: (415) 778-8565

CCN 17324
EN 13.2.9.5

May 4, 1992

Mr. John S. Gregg
Program Manager, Los Vaqueros Project
Contra Costa Water District
P. O. Box 4121
Concord, CA 94524

SUBJECT: LOS VAQUEROS PROJECT, DRAFT STAGE 2 ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. Gregg:

Delta Diablo Sanitation District provides water and wastewater management, engineering, and operational services to the citizens of Discovery Bay. We have reviewed the Draft Stage EIR/EIS for the subject project and note the reference on page 5-34 to the potential impact of Discovery Bay's treated wastewater discharge on the Rock Slough/Old River No. 5 supplemental intake. We understand that the Water District is currently studying mitigation measures and is developing several alternatives, including the relocation of the effluent discharge. 10-1

It is our position that any mitigation measures would be the sole responsibility of the Water District and should have no economic impact on the ratepayers of Discovery Bay.

Very truly yours,

Ronald A. Tsugita
General Manager/District Engineer

RAT:dcw

cc: Tom Torlakson, Supervisor, District 5
Ed Cornell, Chair, Citizens' Advisory Committee
Joe Philbrick, President, Discovery Bay Municipal Advisory Committee

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A political subdivision of the State of California Provides Wastewater Treatment services to the citizens of Antioch, Pittsburg, and West Pittsburg

10-1. Comment noted. CCWD concurs that it would bear financial and other responsibility for such mitigation, if it is needed.

CCN 17738
EN 13.2.9.5

ADMINISTRATION BUILDING
1052 South Livermore Avenue
Livermore, CA 94550
(510) 373-5200

May 12, 1992

cc
JSG
6 lines
Hutton
WHB

John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

SUBJECT: LOS VAQUEROS STAGE 2 EIR/EIS

Dear Mr. Gregg,

The City of Livermore has the following comments on the Draft EIR/EIS for the Los Vaqueros Reservoir Project regarding transportation impacts.

The EIR/EIS evaluates traffic impacts for the year 1995 and the year 2025. The document correctly points out that the level of service on Vasco Road (existing and relocated) as a two-lane facility is unacceptable. However, adding additional traffic to an already unacceptable situation compounds the problem and must be recognized and addressed. While it is not CCWD's responsibility to resolve regional transportation problems, every effort should be made to address the incremental impacts from the proposed project.

Construction Impacts. The additional traffic from construction may be minimal when compared to existing peak-hour volumes; however, the use of Vasco Road (existing and relocated) by heavy construction equipment can cause additional delays and potential hazards. An additional mitigation measure should be included which restricts the movement of heavy construction equipment on Vasco Road to non-peak hour times.

Operation Impacts. The EIR/EIS states that the draft recreation plan associated with the reservoir could generate a peak day-use of up to 9,500 people and up to 1.8 million people per year. While the EIR/EIS states that Vasco Road as a four-lane facility would operate at an acceptable level of service, with or without the project, no analysis is provided to support this statement.

Future traffic impacts are evaluated for the year 1995 and the year 2025. An evaluation of potential impacts far beyond the planning horizon of most jurisdictions is highly speculative. While it is acknowledge that the full build-out of the recreational facilities may not occur until 2025, an evaluation of potential traffic impacts for the year 2010 assuming full build-out should be provided. 11

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CITY OF LIVERMORE

If you have any questions regarding this matter, please contact me at (510) 373-5200.

Respectfully,

Susan M. Frost

Susan M. Frost
Associate Planner

CC: Bob Brown, Planning Director

11-1. The analysis included in the Stage 2 EIR/EIS and the Vasco Road and Utility Relocation Project EIR indicates that the current and projected future level of service on both the existing and relocated Vasco Road is unacceptable. Implementation of the recreation plan is the only component of the Los Vaqueros Project that would contribute to traffic volumes on Vasco Road. The Stage 2 EIR/EIS recognizes that even these minor contributions to a roadway with unacceptable levels of service would be a significant impact. These impacts and measures to reduce these impacts to less-than-significant levels are described in Chapter 13, "Transportation" (see pages 13-26 and 13-31).

11-2. As described on page 13-22 of the EIR/EIS, the additional traffic volumes created by construction of the Los Vaqueros dam and reservoir would generally consist of truck traffic, would not affect the level of service on area roadways, and would be well within the initial screening criteria for impacts developed by the Institute of Transportation Engineers, described on page 13-13 of the draft Stage 2 EIR/EIS. Therefore, no impacts are expected and no mitigation measures are required. However, to further reduce the impact of project construction-related traffic, mitigation measure 13-1 has been included in the list of environmental commitments. See Chapter 19, "Impact Conclusions and Environmental Commitments".

11-3. Chapters 4.10 and 8 of the Vasco Road and Utility Relocation Project EIR, which is incorporated by reference into the Stage 2 EIR/EIS, contains substantial analysis of the local roadway network and provides supporting documentation regarding the ability of a four-lane Vasco Road to provide acceptable levels of service (pages 4.10-59 and 8-25 of the Vasco Road and Utility Relocation Project EIR). The additional traffic added as a result of increased recreation in the Kellogg Creek watershed would occur primarily in off-peak periods and would therefore not meet significance criteria identified in the Stage 2 EIR/EIS.

11-4. CCWD believes that the analysis conducted for the proposed project is appropriate. There is no indication that all recreation facilities will be developed by 2010. In addition, impacts of recreational facilities were identified as less than significant because traffic volumes associated with the recreation facilities did not meet significance criteria. Changing the analysis as suggested by this comment would not affect whether the significance criteria are exceeded.

LETTER NO. 12

RECLAMATION DISTRICT No. 800
AND DISCOVERY BAY RECLAMATION AND
DRAINAGE MAINTENANCE DISTRICT

P.O. BOX 1461, STOCKTON, CA 95201

CCN 17755
EN 13.2.9.5

Cc: JSG
Hutton
Glines
LHB

May 11, 1992

Mr. John Gregg
Contra Costa Water District
P. O. Box H20
Concord, California 94524

Re: Los Vaqueros Project
Draft Environmental Impact Report/
Environmental Impact Statement - February, 1992

Dear Mr. Gregg:

Reclamation District No. 800 (RD 800), which includes the Discovery Bay Development, has a number of concerns related to the impacts of the proposed Los Vaqueros project.

The areas west of Old River that would be inundated by a Los Vaqueros Dam failure, may not be correctly shown. RD 800 maintains a levee along its western boundary, as shown on the attached map. This levee is equal in height to the levee that borders RD 800 along Old River. The dam break model indicates that the Old River levee would not be overtopped; therefore it is questionable as to whether the western levee should be overtopped. This western levee which protects the homes and improvements in a portion of the Discovery Bay Development as well as the agricultural area of RD 800, should be included and appropriately studied in the dam break model. The potential flooding of major urban areas such as Discovery Bay in the event of dam failure is a significant impact which merits careful analysis and mitigation. Future development planned for the area will greatly increase the negative impact. 12-1

The location of the Old River No. 5 intake facility would be located very near the RD 800's south pump station discharge. This pump station discharges agricultural drainage as well as treated wastewater from the Discovery Bay Development. The E.I.R./E.I.S. states that placement of a municipal water supply near a treated sewage discharge would be a significant adverse impact (5-31). If it becomes necessary to relocate any of RD 800's facilities, it is expected that the responsibility and costs will be borne entirely by C.C.W.D. The mitigation of this impact should be thoroughly addressed. The Regional Water Quality Control 12-2

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Board has required that the treated wastewater be discharged to Old River and that such waters not be discharged to Indian Slough. The limited flushing action within the tidal bays of Discovery Bay is a major factor.

At Old River at Highway 4, several instances were cited where a degradation of water quality would occur with the proposed project. We are concerned about the possible impact on water quality within the tidal bays of Discovery Bay. This potential impact did not appear to be addressed. 12-3

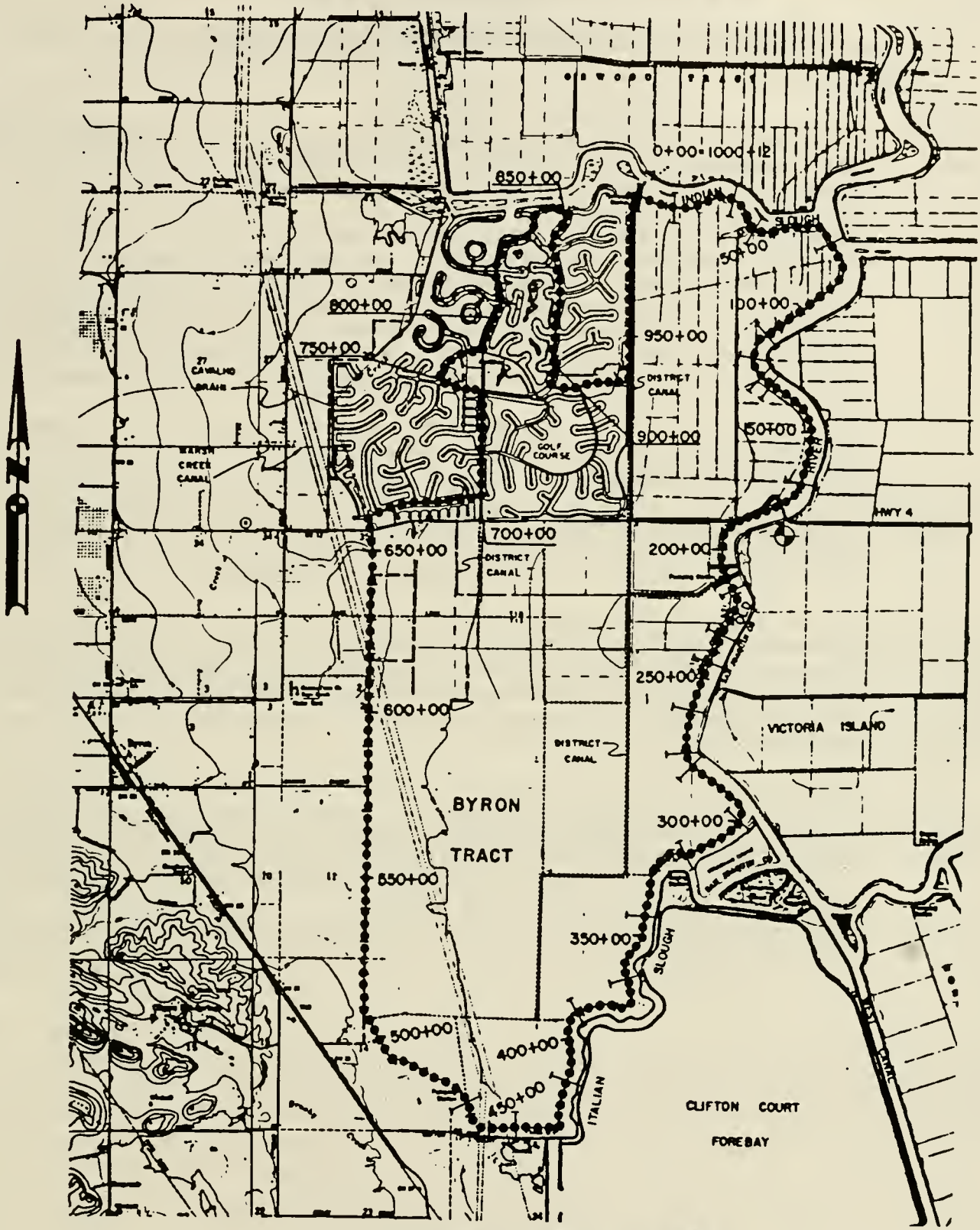
The Old River No. 1, 2, 5 and 6 intake facilities will have a significant impact on RD 800's flood control levee along Old River. RD 800 will require that a permit be acquired for any construction on, over, under or along the levee or drainage facilities. It is absolutely imperative that RD 800's rights and ability for the maintenance and operation of their reclamation works not be adversely impacted. Included in RD 800's reclamation works is the main drainage canal running north and south and partially east and west through the District. It is very important that the long-term operation and maintenance of the canals be considered in the design of the crossings. 12-4

Portions of the RD 800 levee along Old River have been experiencing undercutting and increased seepage due to scouring action. The scouring action appears to be related to export pumping by the CVP and SWP. The location of your intake south of Indian Slough would appear to aggravate an already critical situation. It appears that this potential impact was not considered in the E.I.R. For the same reasons that the SWP is seeking to relocate their intake farther north, you should perhaps give greater consideration to your more northerly locations such as Old River No. 3. 12-5

Yours very truly,

DANTE JOHN NOMELLINI
Secretary and Counsel

DJN:ju
Enclosures
cc: Trustees
Chris Neudeck



RECLAMATION DISTRICT NO. 800
BYRON TRACT

LEGEND:

•••••••••• District Levee

DISTRICT LEVEE

5-6-92

Not to scale

12-1. As the EIR/EIS discussed, the impact of flooding in the event of dam failure is considered to be less than significant because the probability of occurrence is extremely low. Nevertheless, dam failure inundation studies were conducted to examine worst-case scenarios to provide a conservative basis for emergency evacuation planning. While the effects of the levee along Reclamation District (RD) 800's western boundary were not specifically simulated in this assessment, examination of the peak wave height, wave velocity, energy dissipation, and minor seepage losses indicate the described dam failure wave is likely to rapidly overtop and erode this western levee. Although the levee along the western boundary of RD 800 has approximately the same elevation (+13 msl) as the levee that borders RD 800 along Old River, these two levees are not of equal height. The land surface elevation at the toe of the levee along Old River is lower. Therefore, a much larger volume of water could be contained behind the Old River levee.

12-2. Comment noted. Any costs and permitting actions required to relocate the referenced drainage discharge as a direct result of drinking water standards applicable to CCWD's Old River intake facility will be the responsibility of CCWD.

12-3. The water quality issues discussed in the Stage 2 EIR/EIS relate to relatively minor changes in salinity at several Delta locations (generally less than 5 mg/l chloride). These minor changes in salinity would not alter the beneficial uses of waters within Discovery Bay.

12-4. Comment noted. CCWD recognizes the need to obtain a permit for construction activities at levees and has submitted to Reclamation District 800 a draft permit agreement outlining maintenance and operation responsibilities for the Reclamation facilities affected by the Los Vaqueros Project. CCWD will continue to work with the Reclamation District to ensure that the ability of Reclamation District 800 to meet its responsibilities is not impaired as a result of the Los Vaqueros Project.

12-5. During development of the Los Vaqueros Project, CCWD used a model to assess flow patterns in Old River. The model results show that flows in Old River range from about 2,000 to 6,000 cfs in the north, and 9,000 to 14,000 cfs to the south. These variations are caused by tidal action and pumping at the State Water Project and Central Valley Project facilities. The flow discussed above would result in velocities of between 0.333 feet per second (fps) to 2.333 fps in Old River. The 250 cfs CCWD diversions would add, at most, about 0.04 fps to these existing velocities. This contribution is very minor and would not affect undercutting of or increased seepage through levees along Old River.

CCN 17361
CN 13.2.9.5

LETTER NO. 13

SAN RAMON VALLEY FIRE PROTECTION DISTRICT

Administration
Phone: 510-838-6600
Fax: 510-838-6629

1500 Bollinger Canyon Road
San Ramon, California 94583

Fire Prevention
Phone: 510-838-6680
Fax: 510-838-6696

May 22, 1992

cc. JSG
Hatton
Glines
WHB

Mr. Gary W. Darling
Project Permits Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 95424

Dear Mr. Darling:

Our staff members have reviewed the Draft Stage 2 Environmental Impact Report/Statement for the Los Vaqueros Project dated February 1992. We are forwarding our comments regarding pages 16-6 and 16-7, which pertain specifically to the services provided by the San Ramon Valley Fire Protection District.

The following items need correction and clarification:

Page 16-6, last paragraph: The paragraph should read- SRFPD, which now includes the former Tassajara Fire Protection District, would provide first responses to the southwestern portion of the Kellogg Creek watershed, as outlined in the agreement of April 1989 with the Contra Costa County Water District. Two stations in this District are near the western edge of the watershed. Station 36, on Camino Tassajara Road has three engines, and two water tenders. The response time from this station is approximately 15-20 minutes.

Page 16-7, second paragraph: The paragraph should read- Equipment at Morgan Territory Road Station 37, consists of two engines and water storage. This station operates on a volunteer basis, with variable response times depending on the availability of staff.

Page 16-7, Relevant General Plan Policies: 7-81- These paragraphs should read- Wildland fire prevention activities and programs such as controlled burning, fuel removal, establishment of fire roads, fuel breaks, and water supply, will be regional to reduce wildland fire hazards.

13-1

Ambulance Service: The Kellogg Creek Watershed area is served by the Regional Ambulance Company and the San Ramon Valley Fire Protection District. Regional ambulances are stationed at facilities in Livermore, Pleasanton, Dublin, Brentwood and Antioch. San Ramon Valley has four Basic Life Support ambulances, with two Paramedic staffed ambulance which could respond from the San Ramon Valley area. The District also utilizes helicopter ambulance services coordinated through the Incident Commander from the Engine Company at Station 37.

Thank you for the opportunity to review this draft. If I can be of assistance, please do not hesitate to contact me.

Respectfully,

Richard Probert
Assistant Chief, Operations

13-1. Comments noted. The final EIR/EIS has been modified to reflect these changes and these comments will be considered during ongoing planning for construction and operation of the Los Vaqueros Project.

The Board of Supervisors

County Administration Building
651 Pine St., Room 106
Martinez, California 94553-1290

Tom Powers, 1st District
Nancy C. Fahden, 2nd District
Robert I. Schroder, 3rd District
Sunne Wright McPeak, 4th District
Tom Torlakson, 5th District

CCN 17752
EN 13.2.9.5

Contra Costa County

Phil Batchelor
Clerk of the Board
and
County Administrator
(510) 646-2371

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MAY 12 1992
LOS VAQUEROS

May 12, 1992

Mr. Gary Darling
Contra Costa Water District
P.O. Box 4121
Concord, CA 94524

Dear Mr. Darling:

Thank you for the opportunity to review the Draft Stage 2 Environmental Impact Report/Environmental Impact Statement for the Los Vaqueros Project.

The County understands the need for this project as a source of higher quality water as well as a source of emergency water supply, and recognizes significant efforts on the part of the water district to obtain partnership or joint-use commitments from other agencies. However, the EIR/EIS Alternatives Analysis should have included a larger reservoir option. It is indeed unfortunate that other agencies did not take advantage of the opportunity to participate in this project. In particular, from the perspective of statewide water management, it would have been appropriate for local water agencies or the State Water Project to participate in this new water bank. The reservoir would have been more cost-effective and the impacts associated with additional storage capacity would have been minimal. Despite lack of agency interest during early stages of this project, it would have been prudent for the Water District to complete the environmental assessment for the larger reservoir in this document, as this now eliminates any possible joint use possibilities with the present schedule. Recognizing the importance of this project and the need for the project to go forward at this time, the County does not wish for this omission to delay the construction schedule or other aspects of this very important project. 14-1

On Page 1-7 and Figure 13 the areas being considered to receive to Los Vaqueros Reservoir are listed and shown. The map does not appear to be consistent with planning boundaries or spheres of influence for the Oakley or Antioch areas and needs revision. What are the implications for land areas which are outside these boundaries which developers wish to develop? What are the implications for water service to Brentwood in terms of use of the Los Vaqueros water supply? 14-2

On Figure 2-2 the Old River Pipelines #5 and #6 are shown located south of Discovery Bay. Their location appears to provide room for improvements which may be required in the future 14-3

to State Route 4 as discussed in the Caltrans concept report on this subject. The FEIR needs to clarify this proposed pipeline route as it may relate to State Route 4. Is fee simple acquisition anticipated for this pipeline and could a trail to the Delta be constructed on CCWD right-of-way from the reservoir? Consideration of that potential should be included in the Final EIR.

While the Reservoir Recreation Plan provides for access from the north and south, substantial recreational potential exists for residents with access from Alameda County - yet funding for improvements is by CCWD residents. Will user fees be required to offset this imbalance for access to the site from the south? To the extent possible, ease of access and availability of recreational facilities should be maximized for CCWD residents to the north. In addition, some separation is suggested for the multiple-use roadway described in the Recreation Plan, so that walkers/joggers will not be competing with the tram and/or other vehicles along the roadway. 14

Figure 2-13 deals with the Old River Pipelines #5 pipeline and electric transmission line. Will the transmission line be above or below ground? If above ground, the electro-magnetic force issues need to be discussed as they relate to the Discovery Bay area. The County urges new above-ground transmission lines to parallel existing lines wherever possible. The visual impacts of this facility need to be described. 14

Pages 4-24 and 7-36 discuss impacts to levee habitat and site disturbance due to construction. Mitigation for these impacts should take place in a timely manner to offset the loss of habitat over time, as well as the lag time between habitat loss and full value of replacement habitat mentioned in the report. 14

Impacts of the project to fish are found on page 4-54 of this report, generally indicating that mitigation would take place via contribution to fishery mitigation programs developed through the Two-Agency Fish Agreement. Does this Agreement depend on fish hatchery production as mitigation, rather than efforts to boost survival rates of naturally existing fish? As hatchery fish do not have the same survival rate as naturally occurring indigenous species, every effort should be made to protect existing fish. 14

Mitigation for impacts to wetlands is discussed on page 7-37, describing mitigation of jurisdictional wetland areas at a rate generally exceeding 1:1. Contra Costa County General Plan policy supports mitigation of up to 3:1 in some cases to insure no loss of habitat values. In addition to mitigation specified in the report, the County encourages incorporation of wetlands creation and enhancement activities to the greatest degree possible as part of CCWD reservoir activities. 14

Mitigation Measure 7-16 on Page 7-46 states that the County should limit subdivisions of adjacent parcels to prevent secondary impacts to Vasco Road relocation. The measure is loosely written and it is not clear what the DEIR preparers are recommending the County to undertake and the area where this measure is being encouraged to be applied. 14

The discussion on requirements for offsetting the impacts to the San Joaquin Kit Fox are confusing as written and appear to be inconsistent with the requirements the County has recently experienced with the East Contra Costa County Airport; the County was required to provide a 3 to 1 acreage mitigation for impacted areas. The consistency of project mitigation standards by regulatory agencies for differing public and private proposals is confusing. California Fish and Game and U.S. Fish and Wildlife requirements need to be reviewed for consistency with the proposed mitigation measures and the requirements on other nearby projects. The proposed mitigation measure 8-42 does not appear to be consistent with their stated rules. This decision could be precedent-setting. 14-10

Is the Vasco Caves acquisition, discussed on Page 11-11, presumed to now be a project requirement? 14-11

The discussion on fire protection needs to be updated to reflect the merger of Byron Fire Protection District with the East Diablo Fire Protection District. 14-12

On Page 20-6, Table 20-1 incorrectly indicates that Building Permits are issued by the Community Development Department; they are issued by the Building Inspection Department. 14-13

The DEIR does not clearly identify the proposed haul roads for bringing rock and other construction materials and equipment to the project site; it should. Many of the roads in the area are rural in character, are already impacted by traffic, and structural integrity may be threatened by the weight associated with heavy construction equipment. A mitigation measure should be added which will require CCWD to work with the Contra Costa County Public Works Department in determining which haul roads will be utilized and the hours of the day when they can be utilized. 14-14

The District watershed lands historically had more oak trees than presently exist. Extensive cattle grazing has limited the regeneration of new oak trees. The District should commit to an oak tree regeneration project to offset any impacts to the species as an ongoing function of watershed management. In addition, the species locations and mitigation measures associated with oak woodland replacement areas need to be more clearly outlined. Where will the oak woodland replacement areas be located? How will the impacts of woodland loss be mitigated, particularly until the trees reach maturity? 14-15

Page 7-21 addresses project impacts to wetland areas and other significant natural communities. Contra Costa County is requesting CCWD consideration of participation in East County ecological and biological programs. This program generally would provide interpretive educational programs for students, and would be focused on wetlands and water issues. Some agencies are currently involved in this program, which is being formulated, at least in part, for mitigation of impacts to wetlands from specific projects. 14-16

As implementation of this project and fine-tuning of planning decisions go forward, the Water District should consider citizen advisory committee participation, such as those formed by the County for some of our larger projects. 14-17

The County urges the Water District to use local hiring and prevailing wage practices to the extent possible. 14-18

Given the complexity of this project, the DEIR is quite thorough and with some amendments should allow for informed decisions on the project approvals which are required.

Sincerely,

Sunne Wright McPeak
Chair

RG:\
rg3:Darling.Lv

14-1. As described on page 1-15 of the Stage 2 EIR/EIS and Appendix B to CCWD's Section 404(b)(1) alternatives analysis, CCWD expended considerable effort and time to encourage participation by other agencies. CCWD has substantial information regarding the Kellogg Creek watershed that would allow impacts of a larger reservoir to be assessed should participation occur in the future. Because specific information is lacking regarding how large a joint-use reservoir might be, how such a reservoir might operate, what purpose the increased increment of storage might be used for, what the water source might be, and where the water might be used, CCWD and Reclamation believe that attempting to analyze impacts associated with a larger reservoir would be speculative and inappropriate at this time.

14-2. The planning boundary for the City of Antioch was based on the sphere of influence that had been approved by the Local Agency Formation Commission as of September 1989. However, the current southern boundary should be shown along the three section lines to the north. The Oakley Water District boundary was based on that district's planning area boundary as of September 1989.

Some annexations to the CCWD service area have occurred since the planning area used for determining the water demands described in the Stage 2 EIR/EIS was developed. These annexations are discussed on pages 18-17 of the EIR/EIS. These annexations result in only a very small increase in CCWD's buildout water demands. These additional demands are well within the accuracy limits of the original analysis. CCWD's contract with Reclamation for up to 195,000 af/yr is sufficient to provide service to the planning area described in the Stage 2 EIR/EIS, including the annexed areas discussed above.

The possibility of extending water service to other areas in east county is a separate issue and is fully discussed in chapter 17 of the EIR/EIS.

Although CCWD has entered into agreements with both East Contra Costa Irrigation District and the City of Brentwood, substantial new facilities would need to be constructed, and CCWD would need to expand its service area by annexing lands that are now outside of the CCWD service area to serve this area. Both these actions would require CEQA compliance. In addition, Los Vaqueros Project planning does not include providing sufficient facility capacity necessary to provide project-related water quality and reliability benefits to an expanded service area in eastern Contra Costa County.

14-3. The Old River No. 5 and No. 6 pipelines would be located approximately 1,000 feet south of SR 4. Although some latitude exists regarding the specific method used to acquire land, CCWD generally proposes to acquire pipeline alignments through fee acquisition. CCWD believes that a trail constructed along the various water conveyance pipeline routes is generally a compatible use. This potential use is described on page 12-31 of the Stage 2 EIR/EIS.

14-4. CCWD will consider separating some of the multiple-use roadway as recreation planning proceeds. Such separation may involve moving portions of the roadway or may consist of designating new lanes. The issue of reservoir access from the south will be addressed during the development of a resource management plan to be prepared following certification of the Stage 2 EIR/EIS.

14-5. The electric transmission line to the intake facilities will be above ground. CCWD and Reclamation believe that electromagnetic field effects are not an issue for this project. The strength of such fields diminishes rapidly near the edge of the right-of-way and is typically of concern only when

residential density is high near the electric transmission lines. The area through which the new line would pass is rural and no residences are located near the edge of the right-of-way.

CCWD has planned its facilities to parallel existing facility alignments wherever practicable. Chapter 9, "Visual Resources", of the Stage 2 EIR/EIS describes the visual impacts of the proposed electric transmission line and indicates that significant visual impacts would occur along the entire alignment. These impacts are identified as significant unavoidable impacts in the Stage 2 EIR/EIS.

14-6. Comment noted. CCWD and the various resource agencies with which CCWD and Reclamation have been working believe that the proposed mitigation for this impact on levee vegetation is adequate to offset any impacts. See also comments 2-25 and 2-26 by the U.S. Environmental Protection Agency.

14-7. As a result of comments received on the draft EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project, particularly for winter-run chinook salmon and Delta smelt. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta, during the winter-run chinook salmon's season of highest vulnerability. This operation will allow CCWD to eliminate all diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species.

14-8. Comment noted. A detailed wetlands mitigation plan has been prepared and is included as an appendix to the final Stage 2 EIR/EIS. Generally, wetland mitigation areas to be treated exceed impact areas by more than 3:1. CCWD will consider incorporating wetlands creation and enhancement activities into the overall reservoir operations.

14-9. Although the area through which the relocated Vasco Road would pass is zoned agricultural and is outside the urban limit line in Contra Costa County, CCWD and Reclamation recognize that relocating Vasco Road could result in increased pressure to subdivide lands along the entire roadway. Such subdivision could lead to secondary impacts on important natural resources. CCWD and Reclamation believe that Contra Costa County, as the local agency responsible for land use planning and regulation, should take steps to ensure that such subdivision does not occur in areas containing important resources.

14-10. CCWD and Reclamation have continued discussions with the California Department of Fish and Game and USFWS and have developed additional approaches to addressing impacts on the San Joaquin kit fox that are generally consistent with the approaches used for other recent public and private projects in the area. These additional approaches are described in the biological assessment for the Los Vaqueros Project. The USFWS's biological opinion is summarized in Chapter 20, "Consultation and Coordination".

14-11. CCWD has pursued acquisition of the Vasco Caves areas for some time and CCWD and EBRPD are committed to jointly purchasing the areas. CCWD and EBRPD will continue their efforts to acquire this area to preserve and protect its natural and cultural resources. Possession of the caves area by CCWD and EBRPD is expected by June 1994.

14-12. Comment noted. These two fire protection districts have merged. The merger does not greatly affect the ability to provide fire protection services to the project area.

14-13. Comment noted. The appropriate text has been modified in the final EIR/EIS.

14-14. Section A-3 of the Stage 2 EIR/EIS Technical Report contains substantial information regarding the haul routes assumed in the Stage 2 EIR/EIS. CCWD and Reclamation recognize that the structural integrity of some of these roadways may be affected and will work with the county to identify haul routes. This potential impact is described as significant in Chapter 16, "Public Services", and mitigation measures are proposed to reduce these impacts to less-than-significant levels.

14-15. CCWD believes that the mitigation plan it has developed for valley oak woodlands, which is included as an appendix to the final Stage 2 EIR/EIS, adequately addresses all these issues. Measures have been incorporated into the mitigation plan that include specific information regarding the locations and methods of planting, measures taken to improve the likelihood of regeneration, and the recovery of short-term wildlife values.

14-16. CCWD would be very interested in providing such interpretive and educational programs and has included the concept of such programs in its recreational planning process. CCWD will therefore consider participating in the referenced programs.

14-17. Comment noted. CCWD will consider developing a citizen advisory committee to encourage public participation in refining the recreation and watershed management plans.

14-18. Comment noted. CCWD will incorporate local hiring and use of prevailing wage practices to the extent practicable.

Joint Exercise of Powers Agency

BYPASS AUTHORITY
STATE ROUTE 4

City of Antioch | City of Brentwood | County of Contra Costa

CCN 17749
EN 13.2.9.5

May 12, 1992

cc: JSG
Author
Glines
WHB

John Gregg
Program Manager
Contra Costa Water District
P.O. Box 4121
Concord, CA 94525

RE: Draft Stage 2 EIR/EIS for Los Vaqueros

Dear Mr. Gregg:

We have reviewed the Draft Stage 2 Environmental Impact Report for the Los Vaqueros Project and have the following comments.

1. The Delta Expressway Environmental Impact Report is tentatively scheduled to be released in July, 1992. The Delta Expressway preferred alignment is the northerly third of the East County Corridor Study in which the Contra Costa Water District participated. The Bypass Authority has met with community groups, land owners, and East County Policy Makers, and based on their input, the preferred Delta Expressway Alignment was selected to be included in the Expressway EIR. The City of Brentwood and the City of Antioch have set land use policies which the EIR/EIS cites as criteria for alignment of the Los Vaqueros Pipeline. These same criteria were used in development of the East County Corridor Study, as well as the Delta Expressway. Based on these criteria these two facilities should be parallel and contiguous where feasible to minimize environmental impacts. Therefore, the Los Vaqueros EIR/EIS should analyze the impacts of these facilities being parallel and provide mitigations where required. 15-1

2. The discussion of Proposed Developments, on page 12-18, states that the Los Vaqueros pipeline would pass near several proposed development projects in Future Urban Area 2. There is also discussion of developments, both proposed and approved under the planning process of the County, the City of Antioch, and the City of Brentwood General Plans, which may affect the planning for the alignment of the Los Vaqueros Pipeline. Since the Delta Expressway is a component of these general plans, it should be discussed on page 12-18 and shown in Figure 12-2. 15-2

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MAY 12 1992

Board of Directors:
Tom Torlakson, Chairman
Barbara Guise
Joel Keller

Ex Officio:
City of Livermore
Alameda County
Contra Costa Water District

Staff:
Contra Costa County
255 Glacier Drive
Martinez, CA 94553
(415) 313-2382

3. The DEIR should recognize that the Los Vaqueros Pipeline and the Delta Expressway rights of way may be contiguous and parallel, except at proposed interchange locations of the Expressway, such as at Laurel Road, Lone Tree Way, Sand Creek Road, Balfour Road, Marsh Creek Road, and Walnut Boulevard. At these interchange locations, the Delta Expressway right of way is planned to widen to provide for on and off ramps. The Los Vaqueros pipeline will cross these future ramp locations. At this date it appears that the pipeline construction may precede the construction of the roadway. Therefore, the Draft EIR/EIS, should provide criteria for the design of the pipeline, in proposed interchange locations, that will minimize or avoid conflicts. If these ramp crossings cannot be avoided, then sufficient protection should be provided for the pipeline. The design criteria for the Delta Expressway requires the minimum radius of curvature to be 3000 feet. On the other hand, the design criteria for the Los Vaqueros Pipeline provides 500 foot minimum curve radii. Other design considerations include proper depth to avoid future relocations and avoidance of highway drainage facilities. 15-3

4. One of the alignments identified for the Los Vaqueros Pipeline crosses the ridge through the Cowell Property south of Marsh Creek Road. In this same vicinity, the Delta Expressway will also have to cross this ridge but at a lower elevation to meet maximum grade standards. The DEIR/EIS should discuss the impacts of the pipeline crossing the ridge in the same vicinity as the Delta Expressway crossing. Final design of the pipeline should minimize conflicts with grade and depth of the pipeline at this ridge location to prevent future relocation when the Delta Expressway is constructed. 15-4

If you have any questions regarding these comments, please contact me at (510) 313-2255.

Very truly yours,

Lowell Tunison
Senior Civil Engineer
Major Projects

LT:TR:
c:Darling.t5

15-1. Comment noted. The Los Vaqueros pipeline has been designed to generally be parallel and contiguous with the identified right-of-way for the Delta Expressway except where economically infeasible. The impact analyses contained in the Stage 2 EIR/EIS assumes that these facilities were parallel, and the identified mitigation measures were designed accordingly.

15-2. Comment noted. The Delta Expressway has been incorporated into most local plans. The referenced impact analysis was focused, however, on the effects of the Los Vaqueros pipeline on proposed and potential development. The Los Vaqueros pipeline will provide a buffer in some areas between the Delta Expressway and residential uses.

15-3. CCWD has coordinated extensively with Contra Costa County regarding the alignment of the Los Vaqueros pipeline and its relationship to the Delta Expressway. At interchanges, the Los Vaqueros pipeline will either be outside the identified interchange areas or buried deep enough to allow the interchange facilities to be placed on top of the pipeline right-of-way.

15-4. Where the alignments of the Los Vaqueros pipeline and the Delta Expressway are contiguous, the final design of the Los Vaqueros pipeline will account for the potential location of the Delta Expressway to avoid relocating the pipeline when the Delta Expressway is built.

MAY-12-92 TUE 17:17 510 569 1412 P.02

REGIONAL PARKS

EAST BAY REGIONAL PARK DISTRICT

LETTER NO. 16

CCN 17748
EN 13.2.9.5

cc: JSG
Hutton
Glines
WHB

May 12, 1992

Mr. Gary Darling
Contra Costa County Water District
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

SUBJECT: Stage 2 EIR/EIS for the Los Vaqueros Project

Dear Mr. Darling:

The East Bay Regional Park District has reviewed the subject document and offers the following comments. The EBRPD is identified as an agency which may administer the watershed recreation plan (p. 12-20). The EBRPD would have to use the subject document as a Responsible Agency and, therefore, it is concerned that the document adequately address all the recreation related adverse impacts which could occur. The subject document addresses, at the conceptual level, an ambitious recreational development plan and its potential for regional-scale impacts (such as; traffic congestion, noise, air quality, and water quality). As the document refers to EBRPD as a potential operator under CEQA, it must provide the basis for the EBRPD to consider the concept of operating the recreational facilities associated with the Los Vaqueros Project. 16-1

The EBRPD is concerned that the level of detail in the subject report is not sufficient to provide the basis for construction and operation of all the recreation facilities identified. In general, the subject document leaves to future "specific" plans the details of vegetation management, wildlife management, cultural resource management, and recreational activity management. The assertion of the EIR/EIS is that these specific plans can all meet their stated objectives without conflicting with each other. Based upon its 56 years experience operating and maintaining recreation activity in similar large environmentally sensitive lands the EBRPD is concerned that this assertion may not be correct. The EBRPD staff is of the opinion that there may be substantial changes to the conceptual recreation plan which would significantly alter the potential for adverse impacts. These two factors may combine to make it desirable to prepare a subsequent EIR on a revised and more specific recreational use and resource management plan. 16-2

Concerns about specific portions of the EIR/EIS are given below.

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LOS VAQUEROS

5-117

2950 Peralta Oaks Court • P.O. Box 5381 • Oakland CA 94605 0381 • 510.635.0135 • FAX 510.569.4319

Kellogg Creek Water Resources

The discussion of reservoir water quality (p. 6-11) should be substantially expanded to include analysis of the implications of algae blooms on recreational opportunities. While the text indicates that blooms "may inhibit boating", it does not evaluate the probable frequency, duration, or severity of this effect. The text should be elaborated to include an analysis of probable dissolved oxygen levels, and the implications of this upon potential recreational fisheries and upon the recreational value of portions of Kellogg Creek effected by released water from the reservoir. 16-3

In addition to addressing questions about drinking water standards, the discussion also should specifically address the potential for the proposed recreational activities themselves to be adversely effected by water quality parameters. The discussion of fishery resources (pp. 6-15 to 6-16) should be augmented to explicitly consider the combined water quality effects of thermal inversion, oxygen depletion, and reservoir drawdown upon the recreational fishery in the proposed reservoir. The mitigation discussion (p. 6-16) also should be substantially expanded. The existing mitigation measure should be expanded to specify the steps which would be taken if adverse water quality conditions were identified. If "bluestone" (copper sulfate) treatment were to be used in the reservoir to control algae, the impacts of the use of this chemical upon recreational fisheries should be evaluated. This discussion also should be expanded to include recreational fisheries enhancement measures which could be included at the time of construction of the dam. Since material for the dam is to be borrowed from the reservoir bottom, the bottom contour of the reservoir could be engineered to provide spawning beds for warmwater lake species, thereby enhancing the fishery. 16-4

Boating and fishing would be major components of the recreation program, the success of which depends upon the measures taken to protect and enhance water quality in the reservoir. 16-5

Vegetation Resources

The discussion of mitigation for impacts upon vegetation (pp. 7-33 to 7-48) should be altered to indicate that the creation of alkali wetlands, alkali meadows, claypan vernal pools and oak riparian woodlands are all experimental concepts. If attempts at "in kind" habitat replacement at a one-to-one ratio fail, "out-of-kind" wetland creation is likely to be required at two-to-one or greater levels. All recreational facilities and most recreational activities should not occur within the local sub-watersheds which drain into these created habitats. The relatively level portions of the site are the most suitable both for recreation and for wetland creation. Therefore, the text should specifically address the feasibility of the planned recreation, given these potentially conflicting factors. 16-6

Wildlife Resources

The discussion of impacts upon wildlife (pp. 8-13 to 8-38) should be augmented. During and immediately after reservoir construction, the more mobile wildlife species would be displaced to surrounding areas, including the EBRPD's Round Valley. This will result in increased mortality due to lack of resources (e.g., food) and hazardous conditions (e.g., raptorial birds being killed by windmills as documented in a recent study by the California Energy Commission for Alameda and Contra Costa counties). In the Round Valley area this mortality effect could be compounded by a similar displacement of animals from the approved Marsh Canyon Sanitary Landfill site and from the proposed Cowell Ranch Development. 16-7

Cultural Resources

The EBRPD is especially concerned about the potential for adverse impacts upon the Vasco Caves area. The combination of unique geologic, vegetation, wildlife, and cultural resource features of the Vasco Caves area were primary considerations in the EBRPD's designation of them as a potential regional parkland in its Master Plan. The discussion of mitigation for adverse impacts upon cultural resources (pp. 11-20 to 11-24) lacks the specificity needed to determine whether the proposed measures would be effective or feasible. Further, the EIR/EIS lacks a comprehensive discussion of the measures needed to protect all of the resource values present in the Vasco Caves area. As an example of the lack of specific mitigation measures, there is no mention of the need to arrest the normal bedrock weathering processes which threaten the prehistoric pictographs there. Similarly, there is no consideration of the elimination of windmills to reduce the presence of humans who might purposefully or inadvertently damage the cultural resources. As an example of the lack of a comprehensive overview of the multiple resource values at the Vasco Caves, there is no description of the wind-erosion features (including tors, tafony, desert pavement, and concretions) which are among the geologic resources worthy of preservation at the Vasco Caves. Similarly, there is no discussion of the significance of or even the existence of a population of Palmer oak trees in the Vasco Caves area. These deficiencies may cast doubt upon the feasibility and effectiveness of measures identified in the EIS/EIR to prevent damage because of the incorrect impression given that inaction constitutes preservation. 16-8

Notwithstanding the comments above, the EBRPD is supportive of the wide range of mitigation measures which the CCWD has explicitly committed to carry out (pp. 19-1 to 19-8). When such an early commitment is present, it should be possible to carry out early preparations for these measures; for example, salvage archaeological investigations of affected cultural sites and the gathering of acorns for use in replacement plantings from the local oak trees which would be removed. 16-9

The EBRPD urges that this be done as it will take decades to reestablish oak trees. The EBRPD is especially supportive of the mitigation measures (p. 11-12) to protect the Vasco Caves from adverse impacts associated with the realignment of Vasco Road and suggests that the protective fencing and posting be implemented prior to road construction. The EBRPD will be pleased to cooperate with CCWD to mitigate and manage cultural and other resources which cross our common property lines at Round Valley and Morgan Territory.

The EBRPD recognizes that a full and complete response to the comments above may produce significant new information leading to the necessity of revising and recirculating the draft EIR/EIS and thus causing a significant delay in CEQA processing. Alternatively, CCWD could continue the staged environmental review process already begun by preparing a subsequent (Stage 3) EIR based upon a specific vegetation, wildlife, cultural resources, and recreational facilities plan. The EBRPD would continue to offer its expertise in recreation and open space management to facilitate this. Based upon its experience with water reservoir oriented recreational facilities, the EBRPD finds that the currently proposed conceptual recreation plan would not be feasible for this District to operate and would require substantial changes which will alter the potential for adverse impacts. Thus, responding to the comments above, and responding to what will undoubtedly be a different recreational facilities plan, would best be carried out in the context of a subsequent (Stage 3) EIR. The EBRPD strongly urges the CCWD to adopt such a procedure. 16-10

Very truly yours,

T.H. Lindenmeyer
Environmental Specialist

cc: P. O'Brien

16-1. Comment noted. CCWD believes that the Stage 2 EIR/EIS provides sufficient detail regarding the conceptual recreation plan to allow other agencies to use the Stage 2 EIR/EIS for CEQA documentation purposes if the conceptual plan is implemented as described. As CCWD develops final resource and recreation plans, any additional environmental documentation necessary to comply with CEQA will be prepared.

16-2. CCWD believes that the Stage 2 EIR/EIS fully and adequately describes the potential environmental impacts that could result from implementing the conceptual recreation plan as described in the Stage 2 EIR/EIS. If detailed recreation planning indicates that the stated objectives cannot be met, or if substantial changes occur in the conceptual recreation plan, CCWD will prepare any additional environmental documentation necessary to comply with CEQA.

16-3. CCWD believes that the analysis contained in the Stage 2 EIR/EIS is adequate. Although algal blooms are possible, CCWD will manage the reservoir to minimize such problems because algal blooms would adversely affect water quality. In addition, the proposed action would substantially increase recreation opportunities in the project area. CCWD does not consider minor effects that only slightly affect such benefits to be environmental impacts that require detailed discussion.

Fisheries do well in other reservoirs that store water diverted from the Delta, such as Contra Loma Reservoir and San Luis Reservoir. No indication that conditions in the Los Vaqueros Reservoir would be substantially different exists.

As described in Chapter 6 of the Stage 2 EIR/EIS, the quality of water flowing in Kellogg Creek is very poor, except during brief high-flow events, because most of the Kellogg Creek flow is derived from poor-quality local groundwater. Regardless of conditions in the reservoir, the quality of Kellogg Creek flows would improve with implementation of the project.

16-4. As discussed above, other reservoirs that store water diverted from the Delta maintain substantial fish populations, and no indication that the Los Vaqueros Reservoir would be different than other similar reservoirs exists. CCWD recognizes that substantial opportunities exist to enhance fisheries habitat during reservoir construction and has included discussion of possible measures in its conceptual recreation plan. A detailed discussion of such measures is not included in the Stage 2 EIR/EIS because the proposed reservoir would generally have beneficial effects on fish populations and fishing opportunities. Therefore, no mitigation measures are required.

16-5. Comment noted.

16-6. As noted in the Stage 2 EIR/EIS throughout the "Mitigation Measures" section of Chapter 7, "Vegetation Resources", creating certain types of habitats would be experimental and uncertain. The mitigation programs developed in the Stage 2 EIR/EIS, which are included as appendices to the final EIR/EIS, recognize this uncertainty and therefore propose to mitigate impacts using proven methods. CCWD has conducted a multiyear study of the effects of enhancing alkali wetlands and has documented success with these techniques.

Most of the locations at which CCWD is proposing to implement wetland mitigation would not have recreational facilities nearby. A substantial amount of area exists within the Kellogg Creek watershed to conduct both recreation and mitigation activities, and no conflicts are anticipated.

16-7. CCWD and Reclamation recognize that some wildlife species, especially larger, mobile species, would be displaced rather than directly eliminated by reservoir construction and flooding. Emigration of displaced individuals to surrounding lands would temporarily increase local

populations and likely increase mortality rates as populations return to levels imposed by the carrying capacity of these lands. Similar effects would occur as a result of other projects that displace wildlife species onto surrounding lands.

An increased rate of mortality, in and of itself, would not constitute a significant impact. Mortality rates fluctuate naturally whenever favorable environmental conditions result in growth of populations above the long-term carrying capacity of the habitat. A more important measure of impact is whether the carrying capacity, and hence the long-term population levels of Round Valley or other surrounding habitats, would be affected by construction of the Los Vaqueros Project.

The net effect on wildlife populations in Round Valley and other nearby habitats would be to temporarily increase populations. Within several years or less, however, populations would return to preproject levels. Displacement of animals from the reservoir is therefore not expected to have any long-term detrimental effect on wildlife populations at Round Valley or other nearby lands. The long-term effects of habitat fragmentation caused by reservoir construction on the San Joaquin kit fox's use surrounding lands (including Round Valley) is discussed in the draft EIR/EIS and biological assessment.

16-8. CCWD has pursued acquisition of the Vasco Caves areas for some time and CCWD and EBRPD are committed to jointly purchasing the areas. CCWD and EBRPD will continue its efforts to acquire this area to preserve and protect its natural and cultural resources. Possession of the caves area by CCWD and EBRPD is expected by June 1994. Since publication of the Stage 2 EIR/EIS, CCWD and Reclamation have completed compliance with the National Historic Preservation Act and related requirements. The results of these efforts are described in Attachment 3 to the final EIR/EIS. CCWD and Reclamation believe that the mitigation measures proposed in the Stage 2 EIR/EIS are adequate to reduce the impacts of the proposed action to less-than-significant levels. CCWD recognizes the importance of cultural resource sites in the project area and will make every reasonable effort to ensure that they are protected. The mitigation measures presented in the Stage 2 EIR/EIS, however, focus on eliminating and minimizing impacts of the project on cultural resources. The proposed action will not affect normal bedrock weathering processes; therefore, arresting these processes is not included as mitigation in the Stage 2 EIR/EIS. The proposed action will also not affect the number of people in the project area who maintain or are otherwise associated with wind energy production; therefore, no mitigation is required.

The environmental setting contained in the Stage 2 EIR/EIS does not focus on features of the Vasco Caves area, such as unique geologic formations or vegetation resources, because the proposed action and alternatives would have no effect on these resources. However, the presence of these features has been documented in numerous reports published for the Los Vaqueros Project, including the Final Stage 1 EIR for the Los Vaqueros/Kellogg Project (Jones & Stokes Associates 1986) and the Results of Biological Resources Inventories and Habitat Evaluations in the Kellogg Creek Watershed (Jones & Stokes Associates 1989).

16-9. Comment noted. CCWD intends to continue the cooperative relationship it has developed with the East Bay Regional Park District during formulation of the Los Vaqueros Project.

16-10. See responses to comments 16-1 through 16-9. Implementation of the multi-agency Los Vaqueros Project PA will result in a finding of no adverse effect to sensitive cultural resources, according to the SHPO. A letter from SHPO documenting this finding is included in Attachment 3 to the final EIR/EIS.

ACN: 17288
EN 13.2 9-5

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LETTER NO. 17

ADMINISTRATION

MANAGER
Charles Beesley, Ph D

April 20, 1992

Mr. John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

SUBJECT: DRAFT STAGE 2 ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR THE LOS VAQUEROS PROJECT

Dear Mr. Gregg:

Contra Costa Mosquito Abatement District (CCMAD) staff have reviewed the Draft Stage 2 Environmental Impact Report/ Environmental Impact Statement for the Los Vaqueros project and we have some concerns that we feel should be addressed in the Final EIR for this project.

Our first concern is the lack of any mention of potential public health concerns anywhere in the draft E.I.R. Although the project area is currently relatively unpopulated, the introduction of recreational facilities will bring in large numbers of people. Based on our past experience, the project area can expect problems with *Culex* and *Culiseta* mosquitoes. The *Culex tarsalis* mosquito is a potential vector of two viral diseases, Western Equine Encephalitis and St. Louis Encephalitis. 17-1

The proposed mitigation to compensate for the loss of alkali marshes could lead to health problems, as well as a public nuisance. Pg. 7-38 (Monitoring), mentions the necessity of monitoring mitigation to determine necessary corrective measures to remedy undesirable trends in the establishment of the wetlands. However, because many marshes are excellent grounds for extensive mosquito breeding, CCMAD needs to have access to the marsh and be able to monitor for potential mosquito production. 17-2

Pools of standing water may be created by clogged screening devices in the new pumping system or the improper construction or expansion of water intake facilities (pg. 2-5). These small pools of water can produce *Culex pipiens* and other mosquitoes in less then two weeks. 17-3

Ultimately, recreational users will be subject to newly created mosquito sources or previously undetected sources. 17-4

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These users will generate additional service request calls and will in turn significantly increase the level of service required from CCMAD.

During the construction phase of the project numerous potholes, water pools and artificial containers can also be expected to provide excellent breeding grounds for immature mosquitoes. 17-5

Comments to Draft Environmental Report:

1) Chapter 3. DELTA SYSTEM HYDRODYNAMICS: Whenever new waterways are created or changed there is the possibility of water pooling in small pockets. These pools of standing water can produce mosquitoes in less then two weeks. 17-6

2) Chapter 7. VEGETATION RESOURCES: New wetlands construction requires monitoring to ensure proper results. CCMAD should be included as a consultant prior to construction as well as after the wetlands are created. 17-7

3) Chapter 16. PUBLIC SERVICES: The study acknowledges some of the impacts on services that will be required because of the project. It is important to note here that CCMAD will also incur a significant increase in the level of service required under this project and this should be noted in the E.I.R. 17-8

4) HUMAN HEALTH: The Draft E.I.R. does not mention human health as a concern in the project area. The increase in human traffic can have a significant impact on public health because of potential exposure to mosquito borne diseases (as explained previously). 17-9

Recommendations:

1) It should be noted that this office has significant experience in the control of mosquito populations and should be consulted regarding the control of mosquitoes in the project area. 17-10

2) When intake facilities are constructed or expanded the water should be as deep as possible with steep sides to minimize mosquito production. The water level should be kept as constant as possible to avoid production of floodwater *Aedes* mosquitoes. Whenever possible, emergent vegetation should be minimized, as this provides a protective and nutritive habitat for immature mosquitoes. 17-11

3) During construction of the reservoir care should be taken to avoid leaving pools of standing water for longer than one week. 17-12

4) CCMAD has extensive experience in designing wetlands to maximize their habitat value while minimizing mosquito 17-13

production. We strongly recommend that this office be consulted regarding the creation of any new wetlands in the project area.

Therefore, we at Contra Costa Mosquito Abatement District feel that the above areas of wetlands/water, public service and public health should be addressed in the Environmental Impact Report. 17-14

In closing, this office has the expertise, and should be consulted, regarding mosquito control in the project area. Please call our office should you have any comments or questions. 17-15

Sincerely,

Ray Waletzko
Administrative Assistant

CC: Los Vaqueros File

17-1. As with other reservoirs in the area, portions of the Los Vaqueros Reservoir may present opportunities for mosquito production. However, because of prevailing winds in the project area, the reservoir will exhibit substantial wave action much of the time and most of the reservoir surface will not provide conditions suitable for mosquito production. In addition, the reservoir will support populations of mosquito-eating fish and amphibians.

CCWD conducted a brief survey of other agencies operating similar reservoirs in the area and received no reports of excessive mosquito production. CCWD will work closely with the mosquito abatement district to ensure that public health problems do not occur.

17-2. CCWD believes that wetland mitigation sites in the project area would not expose recreation users at the Los Vaqueros Reservoir to an excessive mosquito nuisance. CCWD would provide the mosquito abatement district full access to all wetland mitigation sites.

17-3. The fish screen and pumping facilities of the new Delta intake would be connected to Old River by a short concrete intake channel. When the pumps are not operating, water in the intake channel would circulate with the currents in Old River.

Grading the intake and transfer facility sites would be done according to Contra Costa County-approved grading plans and would be designed to avoid water pooling. Runoff would be channeled to a drainage ditch similar to ditches in use on Byron Tract for agricultural drainage. CCWD does not expect the site to notably increase mosquito levels above background levels.

17-4. Certain small portions of the reservoir and small water bodies, such as stock ponds and minor drainages, could expose recreation users to mosquitos. CCWD would either implement measures to deal with complaints or request services from the mosquito abatement district. Should district services be necessary, CCWD would provide appropriate funding.

17-5. Some additional pooling of water could occur during the construction phase of the project. Any pooling that would occur would be temporary, however, and would be corrected once proper drainage of construction sites has been established. In addition, most of this ponding would occur in the winter when mosquitos are less prevalent. Also, few people would be exposed to these potential sources of mosquitoes. If unexpected problems result, CCWD would request assistance of the mosquito abatement district.

17-6. See response to comment 17-3.

17-7. See response to comment 17-2.

17-8. If mosquito problems arise on CCWD watershed lands and if CCWD does not itself implement remedial action, the mosquito abatement district could experience some increase in service calls because of the Los Vaqueros Project. See response to comment 17-4.

17-9. See response to comments 17-4, 17-5, and 17-8.

17-10. Comment noted. CCWD recognizes the mosquito abatement district's experience in mosquito control and will consult with the district whenever appropriate.

17-11. Water level at the intake site would be controlled both by tidal action and the volume of water flowing to the intake from upstream. Once the intake is constructed, affected levees will be

recontoured similar to existing levees. Because the intake channel would be constructed of concrete, potential emergent vegetation at the intake site would be minimized.

17-12. Several sedimentation ponds will be required during construction to prevent silt-laden runoff from entering Kellogg Creek. Beyond this type of environmental mitigation requirement, CCWD will instruct its contractors to minimize the potential for ponding during project construction.

17-13. CCWD recognizes the district's expertise. CCWD's environmental consultants have met with the district and CCWD will continue to consult with the mosquito abatement district as CCWD develops its wetland mitigation plans.

17-14. See responses to comments 17-1 through 17-13.

17-15. See response to comment 17-13.

CCN 17038
EN 13.2.9.5

SOUTH DELTA WATER AGENCY

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Engineer:
Gerald T. Orlob

March 26, 1992

Mr. John S. Gregg
Program Manager, Los Vaqueros Project
Contra Costa Water District
P.O. Box 4121
Concord, CA 94524

RE: 2/92 Draft Stage 2 EIR/EIS
Los Vaqueros Project SCH#91063072

Dear Mr. Gregg:

On behalf of the South Delta Water Agency (SDWA), I am submitting the following preliminary comments on the February 1992 Draft EIR/EIS for the Los Vaqueros project.

The Draft EIR/EIS should be expanded to provide model run results and a discussion of the potential effects of the Delta diversions at the maximum rate applied for (600 cfs) and at lower rates on the water level and drawdown problems in the southern Delta, particularly in Old River and Middle River. 18-1

The State and Federal Delta exports have caused considerable problems in lowering water levels and often dewatering channels in the South Delta in the vicinity of the exports. Following litigation and negotiations, the SDWA has now arrived at a draft agreement with these entities to mitigate those effects. The Draft EIR/EIS should analyze and discuss whether these proposed additional Delta diversions would increase or aggravate those problems assuming the present case, namely that the southern Delta barriers under discussion as part of the negotiated settlement are not in place. 18-2

I would also like to request a copy of the Technical Report referred to in the Draft EIR/EIS at page 5-13 and

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elsewhere. The Agency may wish to submit further comments after reviewing the Technical Report.

Yours very truly,

WILSON, HOSLETT & WHITRIDGE

By _____
DAVID WHITRIDGE

DW/rdb

18-1. As part of the water rights process, CCWD plans to amend its petition to conform to the analysis performed for the EIR/EIS (intake capacity of 250 cfs). Increasing the intake capacity to 600 cfs would require subsequent CEQA (and perhaps NEPA) compliance review. The Stage 2 EIR/EIS discusses the changes in water surface elevation attributable to project operation on page 3-14 and discusses other hydrologic and water quality effects of changes in flow regime on pages 3-25 through 3-34 and pages 5-17 through 5-34, respectively.

18-2. The existing conditions analysis completed for the Delta system hydrodynamics, Delta system fisheries resources, and Delta system water quality chapters of the Stage 2 EIR/EIS assume facilities, water supply demand, and operational rules that existed in 1990 were in effect and, therefore, did not include any barriers in the southern Delta.

Effects of the proposed project on water level changes are discussed on page 3-14 of the Stage 2 EIR/EIS and are clarified in a subsequent letter from CCWD to the South Delta Water Agency.

LETTER NO. 19

Contra Costa County
FLOOD CONTROL
& Water Conservation District

J. Michael Walford
ex officio Chief Engineer

Milton F. Kubicek, Deputy Chief
255 Glacier Drive, Martinez, CA 94553-4897
Telephone: (510) 313-2000
FAX: (510) 313-2333

April 13, 1992

CCW: 17.2.5.2
EN 13.2.9.5

John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

File: 97-109

Dear Mr. Gregg:

We have reviewed the Draft Stage 2 Environmental Impact Report/Environmental Impact Statement for the Los Vaqueros Project (Stage 2 EIR/EIS) which was received by our office on March 11, 1992, and submit the following comments.

The proposed pipeline and pipeline alternatives pass through several formed and unformed drainage areas. These areas have existing drainage facilities, creeks, drainage ditches and proposed drainage facilities.

The EIR should include the following information regarding the NPDES Permit:

> "Applicant shall comply with all rules, regulations and procedures of the National Pollutant Discharge Elimination System (NPDES) permit for municipal, construction and industrial activities as promulgated by the California State Water Resources Control Board or any of its Regional Water Quality Control Boards (San Francisco Bay - Region II or Central Valley - Region V)."

19-1

In general, the pipeline design for the selected alternative, when developed, must address all conflicts with existing local drainage and future drainage improvements. The plans must clearly identify existing facilities and drainage patterns. In areas zoned for development, the pipelines must provide for anticipated future drainage lines. The EIR will need to address mitigation measures in regards to existing and proposed drainage facilities, creeks and drainage ditches.

The pipeline alternatives shown pass through several proposed drainage areas within which the size and location of drainage facilities are known. The Contra Costa County Flood Control and Water Conservation District (FCD) will provide horizontal and vertical locations of these facilities when needed. There are other areas for which the FCD has no proposed drainage facilities but where existing creeks and drainage swales suggest where future drainage channels and pipelines may be placed. At creek crossings (see enclosure for major crossings) Los Vaqueros pipelines need to be depressed to reflect possible channel improvements. At drainage swales, a minimum cover of 15 feet (top of pipe to existing ground) will be required to allow for installation of future gravity drains.

19-2

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Creek crossings will also require flow diversion plans. Rockslope protection, underlain with filter fabric, must top the trench and will need to extend upstream and downstream from the crossing at least 10 feet beyond the outside diameter of the pipe. Three foot cutoff walls will also be required at the upstream and downstream end of the rock slope protection and will need to extend up the banks to the design high-water line.

We appreciate the opportunity to review this Stage 2 EIR/EIS and welcome continued coordination. If you have any questions, please call Joan Rushton at 313-2286.

Very truly yours,

P. Harrington

Phillip Harrington
Senior Civil Engineer
Flood Control Engineering

PH:JR:kd
c:Gre97109.t4

Enclosure

cc: J. Rushton, Flood Control

19-1. CCWD would comply with all the applicable referenced rules, regulations, and procedures, and is designing the conveyance pipelines to adhere to all conditions placed on new development within the 100-year floodplain.

CCWD has extensively worked with and will continue to work with local agencies and developers to appropriately locate the project's water conveyance pipelines. Mitigation measures are recommended in the Stage 2 EIR/EIS to protect future and existing land uses and sensitive vegetation and wildlife resources.

19-2. CCWD has contacted the Contra Costa County Flood Control and Water Conservation District and has requested and received various design criteria. CCWD intends to continue to coordinate with the district as it designs the project's conveyance facilities.

LETTER NO. 20

Sheriff-Coroner
CCN 17037
Field Operations EN 13.2.9.5

Administrative and Community Services
Investigation Division
Patrol Division

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Contra
Costa
County

Richard K. Rainey
SHERIFF-CORONER

Warren E. Rupf
Assistant Sheriff

Gerald T. Mitosinka
Assistant Sheriff

Rodger L. Davis
Assistant Sheriff

March 24, 1992

Mr. John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

RE: Los Vaqueros Project Draft Stage 2 EIR/EIS

Dear Mr Gregg

The following comments are in reference to the subject of law enforcement services as noted in this draft (pages 16-5, 16-15, 16-22) see attached.

The Contra Costa County Sheriff's Department is highly recognized for its ability to provide customized law enforcement services. Though we would be happy to provide the indicated level of service established in this draft, we would not want to be limited by these early projections.

Our contract law enforcement projects serve as models throughout the state, and Los Vaqueros would be no exception. We look forward to matching our services with your project's needs. As those needs become more evident with time, we hope your staff feel free to contact our agency for any desired assistance.

20-1

Sincerely,

Richard K. Rainey, Sheriff-Coroner
Contra Costa County Sheriff's Department

Lt. Scott L. Parsons, Commander
Administrative and Community Services

RKR:SLP

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MAR 27 1992

AN EQUAL OPPORTUNITY EMPLOYER

20-1. Comment noted. CCWD recognizes that the projections contained in the Stage 2 EIR/EIS are preliminary and will work with appropriate law enforcement agencies to determine appropriate force size and the best methods for providing such service.

CCN 1776
EN 13.2.9.5

14 May 1992
Sunol, Ca. 94586
770 Kilkare Road

Dear Mr. Gregg

I attended the April 7th hearing on the Los Vaqueros Stage 2 EIR/EIS. Due to difficulties in locating Granada High School, I arrived twenty minutes late. To my surprise, the hearing was already closed. Therefore, I am sending my remarks by mail. I realize that these remarks will arrive after your deadline of May 12th, but hope that since I attended the hearing, they will still be included in the Final Stage 2 EIR/EIS.

I am writing these comments as a private citizen, but as I am also a park naturalist, I feel qualified to correctly identify wildlife species. I testified at the hearings on the Vasco Road relocation EIR to bring your attention to a breeding pond for California Tiger Salamanders, which was overlooked in that EIR. The pond is located on the Miguel property approximately 800 feet south of the intersection of Camino Diablo and Camino Vaqueros roads. I lived at Rt. 2, Box 143K, across Camino Vaqueros from the pond. I saw California Tiger Salamanders around my home and in the pond almost every winter. Having shared this information at the Vasco Road Relocation hearings, I was very disappointed that this location was not indicated in the Stage 2 EIR/EIS maps. I am enclosing a copy of map 8-1, with the location marked. I have also marked the location of Tricolored Blackbirds I observed on my property. I sincerely hope this information will be added to all relevant portions of the Final Stage 2 Los Vaqueros EIR/EIS. 21-1

As a taxpayer whose property bounds the proposed project, I was (and still am) appalled that California water law does not allow those who will be directly affected by a project to vote on it. I personally will mourn the loss of beautiful Vasco Valley, with its endangered Valley Oaks, San Joaquin Kit Foxes, Red-legged Frogs and other wildlife, should the reservoir be built. I favor the Middle River Intake/EBMUD Emergency Supply Alternative, which would accomplish your goals of improving quality and reliability of water supplied to CCWD customers without building a reservoir and therefore minimize detrimental effects to the environment. 21-2

Sincerely,

Joanne Dean-Freemire

Joanne Dean-Freemire

cc: Contra Costa County Supervisor Tom Torlakson
California Assemblyman Phil Isenberg
California State Senator Daniel Boatwright
U.S. Congressman George Miller

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MAY 18 1992

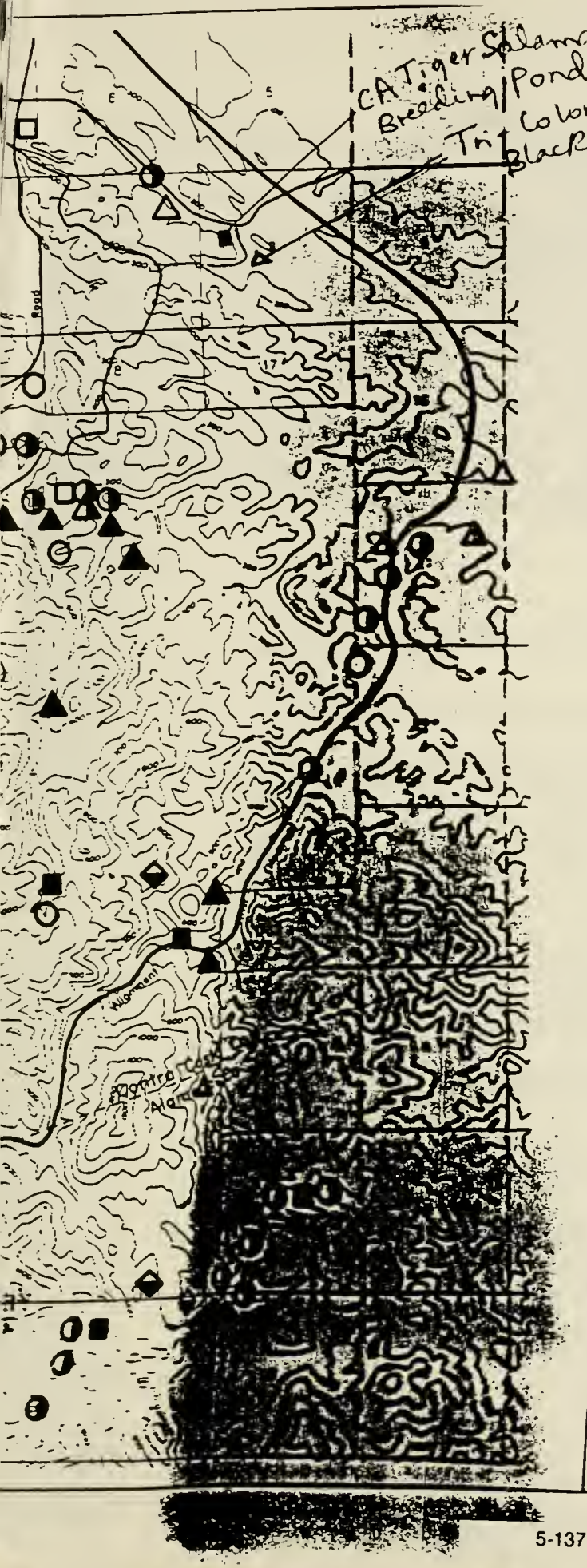

Figure 8-1.
Occurrence of Special-Status Wildlife Species in the Vicinity of the Kellogg Creek Watershed

21-1. As stated in the final Vasco Road and Utility Relocation Project EIR in response to a similar comment from this commenter, CCWD fully recognizes the existence of the tiger salamander population this commenter describes and appreciates the efforts undertaken to make CCWD aware of this consideration. When wildlife resources were mapped in both the draft Vasco Road and Utility Relocation Project EIR and the draft Stage 2 EIR/EIS, information was limited to those resources that could be affected by the proposed project and alternatives. This specific population, along with other wildlife populations that would not be affected, was therefore not discussed in these environmental documents. The population has been added to Figure 8-1.

21-2. Comment noted. CCWD believes that the Los Vaqueros Project, although resulting in some impacts, will preserve a large contiguous area that contains unique environmental and cultural resources that could otherwise be subject to future development. Although the Middle River Intake/EBMUD Emergency Supply Alternative would meet CCWD's water quality goals, it could not meet CCWD's reliability goals.

LETTER NO. 22

CCN 17746
EN 13.2.9.5

Greenbelt Alliance
PEOPLE FOR OPEN SPACE

CC: JSG
Hutton
Elmes
WHB

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Wallace Stegner
Marjorie Stern

John Gregg
Program Manager Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

Re: Comments of Los Vaqueros Project Draft Stage 2 EIR/EIS

Dear ~~Mr. Gregg~~ John:

Greenbelt Alliance has the following questions on the Los Vaqueros EIR/EIS.

What is the size of the right-of-way for the Los Vaqueros pipeline? 22-1

The Delta Expressway/East County Corridor/Mid State Toll Road have each identified a road alignment that is the same as the Los Vaqueros pipeline. Will Contra Costa County, State Route 4 Bypass Authority, or the California Toll Road Company each be required to purchase right-of-way along the Los Vaqueros pipeline from the Contra Costa Water District at full market value? 22-2

What deed restrictions could Contra Costa Water District place on the Los Vaqueros pipeline right-of-way to prevent its incorporation into the Delta Expressway/East County Corridor/Mid State Toll Road and thereby mitigate the adverse impacts of that project? 22-3

Brentwood, Cowell Foundation new town, Oakley, projects on Hotchkiss Track, and Mountain House are each planning major sewer treatment and discharge into the delta. 22-4

What level of treatment for fresh water intake will the Contra Costa Water District be required to perform to maintain water quality, meet water quality goals, and reduce salts for water stored in Los Vaqueros? Is this level of treatment a part of the Los Vaqueros project? What will be the capital cost, financing cost, and operational costs of this treatment facility? 22-5

Could Los Vaqueros accommodate 100,000 - 150,000 cubic yards of water storage from East Bay MUD? 22-6

[more]

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The Bay Area – Keep It Green

What amount of water storage could Los Vaqueros accommodate from the East Contra Costa Irrigation District and the Byron Bethany Irrigation District? 22-7

What level of water treatment from the irrigation districts would be required to maintain water quality in Los Vaqueros in light of sewage discharge from communities in East Contra Costa and San Joaquin County? 22-8

Where is the intake for Los Vaqueros and the Byron Bethany and East Contra Costa Irrigation Districts in relationship to existing and proposed sewage treatment and discharge for Brentwood, Cowell Foundation new town, Oakley, Mountain House, Byron airport, and all projects on Hotchkiss Tract? 22-9

What actions will be necessary by Contra Costa Water District to protect water quality for its ratepayers?

Sincerely,

Mark Evanoff
Field Representative

22-1. The right-of-way for the Los Vaqueros pipeline would be 125 feet wide to accommodate both permanent and construction activities. Some areas near Old River may require a greater right-of-way width because of unstable soil conditions.

22-2. The Los Vaqueros Pipeline has been located by CCWD to follow existing utilities, where practicable. The intent of this objective was to minimize impacts on land owners and land uses.

During this location process, CCWD has held numerous meetings with property owners and continues negotiating with them on issues related to compatible adjacent and surface uses of the pipeline right-of-way.

It is CCWD's understanding that a joint use Delta Expressway and Los Vaqueros Pipeline right-of-way is not acceptable to Contra Costa County or the state.

22-3. See response to comment 22-2.

22-4. Comment noted. CCWD will review plans and coordinate with project proponents on future wastewater discharges into Old River to minimize effects on CCWD's water supply.

22-5. CCWD is not proposing to meet its mineral water quality goals through water treatment. The Los Vaqueros Reservoir would allow CCWD to store high-quality Delta flows for use when Delta water quality deteriorates. Therefore, additional treatment costs are not expected. To maintain water quality in the Los Vaqueros Reservoir, CCWD will monitor the quality of water at the intake site and divert water to the reservoir only during periods of acceptable water quality (see page 2-6 of the Stage 2 EIR/EIS).

22-6. During planning for the Los Vaqueros Project, CCWD solicited the participation of other agencies and entities that could have benefitted from the project. Advantages of such an approach include more effective regional water planning and lower project costs to CCWD ratepayers and potential participants. Although Alameda County Water Conservation District Zone 7 and the East Bay Municipal Utility District showed some interest initially, each subsequently declined to participate in the project. CCWD's efforts to develop participation are summarized on page 1-15 of the Stage 2 EIR/EIS and are fully documented in CCWD's Section 404(b)(1) Alternatives Analysis for Meeting Water Quality and Reliability Objectives (1991).

Because no other agency chose to participate, CCWD configured the Los Vaqueros Project to serve only CCWD's needs. The project consists of a 100,000-af capacity Los Vaqueros Reservoir that releases water directly to the Contra Costa Canal. The reservoir would not be capable of storing water in addition to the 100,000 af required to serve only CCWD purposes.

Considerable engineering and environmental work has been completed since the decision was made to pursue a CCWD-only Los Vaqueros Project. This work has been based on a CCWD-only project.

22-7. See response to comment 22-6.

22-8. In addition to the measures described in response to comment 22-5, the sizing of the reservoir, diversion schedule and criteria, and all other project operations have been developed to account for all water quality parameters of concern in Old River. The referenced discharges have been considered in developing project operations, and no additional water treatment would be required.

22-9. CCWD is aware of these potential future wastewater discharges and is coordinating with various project proponents and regulatory agencies to ensure that the quality of CCWD's water supply would not be negatively affected by these discharges. Many of these discharges would involve land disposal methods.

CCN17339
EN13.2.9.5

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MAY 11 1992

Public Information Office
Contra Costa Water District

May 5, 1992

James A. Hanson
5340 Degnan Dr.
Martinez, CA 94553

Contra Costa Water District
1331 Concord Ave. Box H20
Concord, CA 94524

RE: Los Vaqueros EIR Comments

These are written comments in response to the recently released EIR since I have not been able to attend the presentations.

As a voter, this project was submitted on the basis of reducing salinity and improving the existing water supply to existing customers. The Los Vaqueros EIR focuses on the environmental impacts to the wildlife and cultural history of that particular site.

The project has not been presented as a water source for planned housing and commercial developments, particularly in the East County. If that is in fact one of the goals of this project I, as a district customer, wish to know that and what the impacts will be. If ratepayers are paying to supply water for new growth they should told that. Specifically:

1. The EIR and District public information should directly and prominently state this as a project goal.

2. If any Los Vaqueros water is to be used for large new development because existing supply is inadequete, the EIR should include a discussion of the traffic, public services, and all other environmental impacts that increased water supply would make possible.

23-1

Thank you for your attention to these comments, and my requests if warranted.

Sincerely,

James Hanson

James A. Hanson

23-1. The planning assumptions with which the project was formulated are described on pages 1-6 through 1-10 of the Stage 2 EIR/EIS and are discussed in greater detail in CCWD's alternatives analysis required by Section 404(b)(1) of the Clean Water Act.

To meet the water needs of planned future growth within its service area, CCWD will need to divert its full contractual entitlement of CVP water from Reclamation. See also response to comment 14-2. The Los Vaqueros Project does not materially affect CCWD's ability to provide water to its service area. The Los Vaqueros Project would eliminate the need to make some improvements to the Contra Costa Canal system but would not significantly alter the amount of water that can be delivered to the CCWD service area because other physical limitations in the delivery system would still exist. The Los Vaqueros Project would be designed to divert to the Los Vaqueros Reservoir a portion of CCWD's contracted water supply when Delta flows are high and water quality is good. When water quality in the Delta is poor, CCWD would release water from the reservoir and reduce pumping from the Delta.

The Los Vaqueros Project would not materially increase the water supplies available to CCWD, but would improve the overall quality of CCWD water supplies.

LETTER NO. 24

D E L T A W E T L A N D

CCN 17340
EN 13.2.9.5
May 12, 1992

dc:
Hutton
Glines
Blackmon
JSG

Mr. John Gregg
Contra Costa Water District
P. O. Box H2O
Concord, CA 94524

Dear Mr. Gregg:

Re: Comments on Draft EIR/EIS for the Los Vaqueros Project

We are taking this opportunity to submit the following comments regarding the DEIR/DEIS for the Los Vaqueros project.

1. Waterfowl Hunting

The project as proposed does not include waterfowl hunting at the reservoir site. The creation of a substantial reservoir without provision for hunting is likely to cause significant adverse impacts on waterfowl values in nearby wetlands. Waterfowl will use the reservoir, the availability of recreational hunting opportunities will substantially decrease, and the hunters who maintain and manage much of the Central Valley wetlands critical to the waterfowl populations will reduce or eliminate their support for wetlands habitat. For evidence of the nature and extent of the potential impacts, please refer to the San Luis Reservoir experience. 24-1

2. Inadequate Alternatives Analysis

A major defect in the document is that it fails to adequately address the alternative of a larger storage facility to operate in conjunction with other water purveyors. Both CCWD and others need more downstream water storage. At minimum the Los Vaqueros facility should be designed to allow expansion without the likely cumulative impacts future demands will place on the environemnt with new reserviors. 24-2

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5-145

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Lafayette, CA 94519
tel 510 283 1216
fax 510 283 4028

We feel there are also significant benefits associated with the project that are deserving of praise. Environmental benefits of the project are too often overlooked when they should be considered as offsets to adverse impacts where possible. Benefits of the Los Vaqueros project include fish screening and operational flexibility. Some of the project diversions will be screened. All present diversions are unscreened. Therefore, any new fish screens will create a fishery benefit in the surrounding area. This benefit would be further enhanced if all diversions were to be effectively screened. 2

The basic concept of Los Vaqueros creates an operational flexibility for water quality and supply purposes. This same flexibility can serve to benefit fisheries as pumping rates can be adjusted to accommodate special fishery needs in the Delta. 24

Thank you for the opportunity to submit these comments.

Sincerely,

John L. Winther
President

JLW:kf

24-1. Waterfowl use of the reservoir and its effects on use of nearby privately managed wetlands was recognized in the Stage 1 EIR for the Los Vaqueros/Kellogg project. The proposed recreation plan for the reservoir includes recreational boating as an encouraged use. Experience at nearby Bethany Reservoir indicates that boating use will be adequate to discourage large accumulations of waterfowl on the Los Vaqueros Reservoir. At Bethany, waterfowl concentrated in large numbers until boat ramps were installed. CCWD wants to discourage large concentrations of waterfowl to prevent indirect effects on hunting opportunities at neighboring wetlands.

If recreational use does not adequately discourage waterfowl concentration, CCWD will implement additional measures as defined in consultation with DFG and USFWS.

24-2. CCWD undertook substantial efforts to include other participants in the Los Vaqueros Project and incurred delays and expense in doing so. No other agency chose to participate in the Los Vaqueros Project. CCWD does not have sufficient funding nor a demonstrated need to construct a larger or expandable facility at this time. See also response to comment 2-6.

24-3. Comment noted. CCWD concurs that the Los Vaqueros Project could provide benefits to fish and wildlife resources. The biological assessment for the Los Vaqueros Project contains a thorough discussion of existing losses of special-status fish species at CCWD's existing intake facility. The biological assessment concludes that screening that intake would be costly and ineffective. However, the CVP Improvement Act requires Rock Slough to be screened.

24-4. Comment noted.

CCN17735
EN 13.2.9.5

LETTER NO. 25

SIERRA CLUB
SAN FRANCISCO BAY CHAPTER

5237 COLLEGE AVENUE • OAKLAND, CALIFORNIA 94618-1414
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dc: Hunter 6 lines Blackmer JSG

3 May 1992

Mr John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

RE: EIR/EIS for Los Vaqueros Project

Dear Mr. Gregg:

We have reviewed the Draft Stage #2 EIR/EIS for the Los Vaqueros and offer the following comments concerning the proposed project.

Buildout Populations

The EIR/EIS makes assumptions regarding buildout in the CCWD SOI and makes statements regarding relationship to other potential water districts in the east county for the future. The EIR/EIS also assumes that a certain amount of growth will occur within the east county without addressing the location of that growth any further than by assuming it will occur within the areas identified by the County General Plan. 25-1

We think that this approach is too simplistic. The construction of what will be perceived as an expansion of water supply for CCWD will attract growth in an area which is already identified as a major growth area of the county. The EIR/EIS does not adequately dismiss the possibility of CCWD becoming the major water purveyor in this region and the ways in which that would affect future growth. The general plan seems to have identified some areas for growth, but it is not clear that they were based on the assumption that the reservoir would be built or that Vasco road would be relocated. The potential growth in the east county and its impact on the environment throughout the project area on roads, recreation, wildlife, and future utilities should be better addressed. Stating that a supplemental water supply would be needed in event of expansion (p 17-1) is not an adequate response to the potential growth induced by the proximity of the new reservoir and the proposed road improvements which are listed as mitigation measures since it delays environmental impact analysis rather than examining cumulative effects which may affect the project now. 25-2 25-3 25-4

Growth could well occur along the County Line Alignment (Modified) road (p 12-24). The proposal that Contra Costa and Alameda Counties `could restrict access to the roadway and could regulate parcel subdivision along the alignment', does not adequately address the issue of potential growth along the new road in a sensitive wildlife area. 25-5

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Transportation

Aside from the statement (p 13-3) that `the expected increase in traffic volumes is consistent with the increase in land use development projected in the Tri-Delta Transit service area and the Livermore/Pleasanton area', there is not an indication of how projected traffic patterns were developed or whether they are reasonable. Three factors make the projected figures suspect. First, the impact of using Vasco Road as a corridor to connect with proposed BART facilities was ignored due to lack of hard projections. There will be some impact regardless of whether the projections can be verified now or not. Second, the potential impact of the proposed airport is not included. This could radically alter not only transportation, but entire growth patterns as well. Third, it has been demonstrated time and again that growth begets growth. Improvement of roads and other infrastructure will encourage additional growth. 25-6

Reference was made to allowing cattle crossings on the proposed County Line Alignment (Modified) road. It was not at all clear whether this was intended to be grade crossings or special under/over passes. These will have an impact on the level of service for the proposed road. 25-7

If the Level of Service of the proposed County Line Alignment (Modified) road is kept too low, it will have an impact of not providing adequate service and creating delays at various places along the road. This will be especially true if cattle crossings are grade crossings. If the level of service is too low, there will be interest at some point in increasing the level of service, requiring additional construction in the already sensitive area. This would not be acceptable. 25-8

On the other hand, if the level of service is too high, it will be an encouragement for additional growth in the area and an encouragement for the developers of the proposed toll road to try and use it. If the County Line Alignment (Modified) road is built, we must insist that the level of service and alignment be carefully analyzed to preclude additional construction activities in the area in years to come. 25-9

Wildlife

There are many sensitive species located in the Kellogg Creek Watershed. The existing ecosystem would be disturbed, if not destroyed by construction of either of the two reservoirs. There is not enough known about some of these species to know whether they would recover after construction of the reservoir, if built. The loss or reduction in numbers of even one species can have a cumulative effect on the other species in the area. 25-10

Recreation is listed as a benefit to the overall project. However, the effects of allowing recreation within the watershed may, in fact, provide additional stress on any species which do remain after any construction allowed. 25-

In chapter 8 there is discussion of conducting surveys at the site to determine the mitigation requirements for construction, if either of the reservoir sites is chosen. More information is needed before the acceptance of the EIR/EIS and before a reservoir alternative is selected. 25-

There are several mitigation measures mentioned with regard to construction activities and employee conduct on-site (p 8-40 ff). There is no apparent safeguard measure to ensure that these measures would be followed. 25-1

Desalination Plant

There does not appear to be an analysis of the impact of discharging 5-25 mgd of brine (with estimated 3,500 mg/l of TDS and 1200 mg/l of chlorides) into Suisun Bay. There is no analysis of the impact which that water will have on the overall salinity of the Bay when mixed with flows in the Bay. To state that this impact will be reviewed later is to deny the opportunity to fully assess this alternative now. 25-

Generally, there are too many areas where the EIR/EIS has relied on previous reports which may not be specific enough regarding changing conditions in the east county area. The EIR/EIS assumes that growth will occur in identified regions rather than acknowledging that the project may be a precipitating factor in the future growth of the region. There are several areas where more study is required to provide information to allow informed decision making, but these areas have been dismissed as requiring study `after the fact'. 25-1

Regards,

Paul A Colbert

Paul A. Colbert
Co-Chair, Water Subcommittee

25-1. As indicated on page 18-1 of the EIR/EIS, the approach used for evaluating cumulative impacts is a combination of the approaches recommended in the State CEQA Guidelines (14 CCR 15130[b]).

25-2. As indicated in the Stage 2 EIR/EIS, the project has been designed as a water quality and reliability project. The project would not allow CCWD access to any additional water supplies, nor would the project facilitate distribution of water supplies into areas not currently serviced by CCWD.

Contra Costa County and the municipalities within the east county area are responsible for regulating growth within the project area. CCWD water system improvements would correlate with the growth rates and levels of service planned for and allowed by various city and county planning agencies. Other than a small amount of growth that could be stimulated because of the additional recreation opportunities presented by the project, growth that would occur with implementation of the project would be similar to growth that would occur under no-action conditions. The Los Vaqueros Project would, therefore, not affect growth assumptions contained in the general plan.

25-3. Project-related growth would likely be limited to that described above under response to comment 25-2. The Stage 2 EIR/EIS does, however, evaluate the contribution of the project to cumulative and growth-related impacts in the region.

25-4. As stated on page 17-1 of the Stage 2 EIR/EIS, expanding water service into the east county area is not a component of the Los Vaqueros Project. Should CCWD decide at some point in the future to expand water service into this area, additional environmental analysis under CEQA would be required.

The growth potentially induced by the reservoir is discussed on pages 18-16 and 18-17 of the Stage 2 EIR/EIS. Although relocation of Vasco Road was listed as a mitigation measure in the Stage 1 EIR for the Los Vaqueros/Kellogg Project, it was the subject of a subsequent EIR that fully evaluated the growth-inducing effects of relocating the roadway and several other utilities from the Kellogg Creek watershed.

25-5. Counties and cities in the vicinity of the road relocation have no plans for growth in the road relocation corridor. Most of the corridor is zoned and designated for large-parcel agricultural uses and is outside the urban limit line in Contra Costa County.

Some minor growth could occur along the relocated Vasco Road. Considering the rugged terrain along the County Line Alignment (Modified), less suitable acreage is available for development along the relocated roadway than along the existing Vasco Road. Contra Costa and Alameda Counties would be responsible for managing growth along the relocation corridor.

The Stage 2 EIR/EIS includes mitigation that CCWD believes would reduce the impacts of the project on terrestrial species to less-than-significant levels. These mitigation measures were developed through communication with DFG and USFWS that has taken place regularly since 1988. CCWD has completed formal consultation with both the National Marine Fisheries Services and USFWS and is continuing to consult with DFG on its responsibilities towards special-status species.

25-6. As stated on page 13-3 of the Stage 2 EIR/EIS, future year travel patterns were based on transportation data from the draft Contra Costa County General Plan, the Oakley General Plan, the Livermore Community General Plan Circulation Element, the Livermore I-580/Route 84 traffic study draft report, and the route concept report for I-580. These studies contain the most current data available for the project area. Specific information is not yet available for the proposed airport or BART facilities and therefore cannot be included in the analysis. CCWD believes that the information contained in the EIR/EIS is appropriate for analyzing the impacts of the Los Vaqueros Project.

25-7. Cattle crossings would be culverts or box-culverts and would have no effect on traffic flow.

25-8. CCWD is obligated to replace the existing road, following current Alameda and Contra Costa County road design standards. Growth and traffic projections indicate that the Vasco Road corridor will need to be upgraded to four lanes in the future to adequately handle projected traffic volumes. The relocation of Vasco Road does not substantially alter this need, which is created by regional growth patterns.

25-9. See response to comment 25-8 above. CCWD is designing the relocated new roadway to be generally similar to the existing Vasco Road with some additional safety improvements, including 8-foot-wide paved shoulders, climbing lanes, increased curve radii, and increased lane widths.

25-10. CCWD has conducted extensive biological studies of the Kellogg Creek watershed since 1987 and has communicated extensively with DFG and USFWS to identify impacts and develop measures to reduce or eliminate impacts on wildlife and plant species. As mandated in CCWD Board Resolution 88-45, CCWD has sought to reduce all significant impacts to less-than-significant levels. CCWD believes that its previous studies, the Stage 2 EIR/EIS, and the biological assessment provide an adequate basis for analyzing impacts and developing mitigation measures.

25-11. CCWD recognizes that recreation activities could be the source of additional impacts on sensitive wildlife and plant species. The Stage 2 EIR/EIS includes analyses of the potential effects of the conceptual recreation plan on these species, and recommends mitigation measures for significant impacts.

25-12. The additional surveys cited in this comment refer to mitigation measure 8-1 in the Stage 2 EIR/EIS, which requires CCWD to conduct surveys on small areas (about 20 acres) that have not previously been surveyed because of lack of access and to mitigate any additional impacts as identified in the rest of the wildlife mitigation section. Given that CCWD has conducted surveys over thousands of acres in the project area, the information developed through these surveys will not provide substantial new information that may affect the selection of an alternative.

25-13. CCWD has developed construction monitoring programs for each project component. Qualified monitors will be onsite to ensure that incidental construction impacts are avoided and to monitor employee conduct. A qualified archeologist will be employed to monitor excavation activities in areas that could contain subsurface cultural resources as appropriate. The archeologist will ensure that all proper measures are taken in the event that cultural resources are discovered.

The CCWD Board of Directors must adopt a mitigation monitoring and reporting plan at the time the project is approved.

25-14. The impacts of discharging brine waste from the desalination plant into Suisun Bay are discussed on page 5-35 of the Stage 2 EIR/EIS. Discharges of the brine waste, even after dilution in Suisun Bay, may exceed basin plan objectives for salinity and ions and, therefore, would represent a significant impact. If this project were to be proposed and permits pursued, modeling would need

to be performed to determine appropriate dilution requirement, aid in design of the plant's wastewater diffuser, and determine whether treatment of the brine is required and feasible.

25-15. See response to comment 25-2 above.

KENETECH/ U.S.WINDPOWER

KENETECH
U.S. WINDPOWER, INC.
One Kaiser Plaza, Suite 675
Oakland, CA 94612-3610
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EN 13 - 95

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

April 16, 1992

Mr. John S. Gregg
Project Manager
Los Vaqueros Project
Post Office Box 4121
Concord, California 94524

RE: Comment Letter - Draft Stage II EIR/EIS ("EIR") for the Los Vaqueros Project

Dear Mr. Gregg:

We are extremely concerned at the absence in the EIR of any discussion of: (1) the impact of the Project on the wind resource, contrary to the specific terms of the March 1991 Project Scoping Report, and (2) several additional issues raised in our April 16, 1990 and June 21, 1991 letters to you. More specifically:

1. Wind Resource. In our April 16, 1990 letter we indicated that the EIR needed to analyze the impact on wind resources of changes in topography caused by the Project. Pages 5-51, 5-66 and 5-67 of the Scoping Report stated that you would conduct this analysis in the EIR. We did not see any such discussion in the EIR, nor did we see any discussion of the reasons for its exclusion.

   Not only is the EIR inadequate without such analysis, but it will be insufficient to undertake such analysis at this point and include it only in the Final EIR. CEQA §21092.1 requires recirculation of the draft EIR whenever significant new information is added to a report or where there are substantial changes to the initial draft (see, e.g., Sutter Sensible Planning v. Sutter County Board (1981), 122 Cal. App. 3d 813). 26-1

   In light of your commitment to undertake the analysis in the Scoping Report, we simply fail to understand why you have apparently concluded, without any analysis, that the impact of the Project on the wind resource is so insignificant as to warrant no discussion.

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2. Other Impacts. In order to evaluate the effect of the Project on our existing and potential wind projects, our April 16, 1990 letter indicated various other impacts of the Project which would require compensation such as removal or relocation of existing facilities, lost future development values and disruption during construction. We also expressed concerns about recreational use and the need for U.S. Windpower to have the continued and undisturbed use of the properties under its wind easements. 26-2

Though the Scoping Report indicated that the draft EIR would assess these potential land use conflicts (see pages 5-50, 5-51, 5-55, 5-56 and 5-67), we did not see this analysis in the EIR apart from a 3-sentence "Redevelopment Guideline" for recreational use on page A-14 of the EIR Technical Report, which in no way describes how public access to these properties will be prevented. Further, we did not see any analysis of the Project's potential reduction of County tax revenues due to the negative impact on wind energy facilities, as requested in our June 21, 1991 letter. 26-3

We would appreciate meeting with you immediately to understand why you have ignored our concerns.

Very truly yours,

James J. Eisen

JJE:slm

26-1. CCWD originally intended to include information in the draft EIR/EIS regarding the reservoir's effect, if any, on wind resources, but could not obtain such information from Kenetech/U.S. Windpower. CCWD subsequently contracted with San Jose State University to conduct the necessary wind studies. Information acquired from three anemometers was used, and data were input into a mathematical computer model and the reservoir effects on wind velocity, direction, and frequency were modeled.

The results of these studies showed that daily average windspeeds would be slightly higher (approximately 2% of the daily mean windspeed or 0.2-0.4 mph) to the east and northeast of the reservoir, benefitting wind turbines located in this area. The model also predicted a smaller region in which windspeeds toward the southeast, southwest, and northwest would be decreased by approximately 0.1-0.07 mph. Given the accuracy of anemometry and the magnitude of spatial variations in interannual mean windspeeds typical of the Altamont Pass area, the actual decrease may be undetectable.

Overall, the wind studies indicate that the reservoir would either have an undetectable effect or slightly positive effect on wind velocity. These small changes would not produce any detectable physical effect on the environment.

Because of the negligible effect the reservoir would have on wind velocity and direction, CCWD does not believe that the results of this wind study present significant new information.

26-2. Removal or relocation of existing facilities and construction-related impacts were analyzed and found to be less than significant in the draft and final EIR for the Vasco Road and Utility Relocation Project. These discussions appear on pages 4.7-9 to 4.7-10 of the draft EIR and pages 3-160 to 3-164 of the final EIR. The information on the referenced pages is hereby incorporated into this response. No new information has been obtained that would require any change in these conclusions.

CCWD plans, however, to compensate wind power companies for removal, relocation, or any other compensable losses related to relocating watershed utilities and Vasco Road.

CCWD does not plan to acquire the rights to develop wind power because such rights are expensive, and the reasonable exercise of these rights is not incompatible with watershed protection. Therefore, CCWD's purchase of the underlying lands would not affect the ability of the wind power companies to expand operations into areas for which they already own development rights. If further expansion is pursued by the wind power companies, their plans would be subject to approval by local jurisdictions.

As stated in the Stage 2 EIR/EIS, CCWD does not plan to locate recreation facilities in windfarm areas and, as indicated on page A-14 of the Stage 2 EIR/EIS Technical Report, will restrict access to these areas. Because this recreation planning guideline will be implemented in locating and designing recreation facilities and managing use areas, impacts are not anticipated. Although CCWD cannot now determine specific measures to restrict access to windfarm areas because such measures necessarily depend on the nature and location of the recreation facilities, such measures could include fencing, patrolling, and posting appropriate signs.

26-3. As described in response to comment 26-1, effects on wind patterns in the project area are negligible and may be undetectable. CCWD is not aware of any information that indicates that the proposed action would meaningfully affect the county tax base.

CCN 17323
EN 13.2.9.5

LETTER NO. 27

6 lines
Blackmer
JSG

Pacific Gas and Electric Company

123 Mission Street
San Francisco, CA 94106
415/972-7000

May 1, 1992

Mr. John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

RE: COMMENTS ON DRAFT STAGE 2 EIR/EIS FOR THE LOS VAQUEROS PROJECT

Dear Mr. Gregg:

PG&E has reviewed the Draft Stage 2 EIR/EIS for the Los Vaqueros Project. We would like to thank you for your consideration of our comments and questions regarding the Administrative DEIR/EIS. We have the following comments on the Draft Stage 2 EIR/EIS:

General Comments

PG&E has conducted a feasibility study for supplying power at the Camino Diablo transfer reservoir site only. It is indicated in the Draft EIR/EIS that this site is the preferred alternative. If this does not become the approved alternative it will be necessary to conduct a feasibility study for providing service to another site. 27-1

It is imperative that PG&E receive formal notice of the power supply option required for the transfer pumping plant so we can meet your project schedule. If you select service from our existing 230kV transmission line to a substation at the transfer pump site, we must commence filing immediately with the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (CPCN). One requirement of the CPCN application is an environmental review specifically for the new electric transmission line. Please inform PG&E as soon as possible which power supply option has been selected for the transfer reservoir. 27-2

A number of references are made to the PG&E Hill Transfer Reservoir Site. Please clarify why PG&E is referenced at this site. 27-3

Impacts associated with the electric transmission facilities are dependant upon the type and the location of the facilities. For example, the discussion of potential impacts in the Visual Resources section describes where the transmission lines would be located with various configurations. The discussion of impacts is purely speculative since PG&E cannot verify the adequacy of these locations without further study. Therefore, PG&E cannot assume responsibility that our facilities have been adequately described in the DEIR/EIS. 27-4

Specific Comments

Page 7-16
The impact discussion of the electric transmission line corridor indicates that 0.8 acre will be affected. This is apparently referring to the new transmission line. Please clarify whether both the new electric transmission line and the relocated transmission line impact 0.8 acre. 27-5

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Page 7-19
The impact discussion for the electric transmission line relocation also indicates that 0.8 acre will be affected. Please clarify whether both the new electric transmission line and the relocated transmission line impact 0.8 acre. 27-6

Page 7-15 Table 7-1
Under the headings "Electric Transmission Line" and "Natural Gas Pipeline," the word Relocation should be added for clarity. Clarify where the new service falls in this table. 27-7

Page 7-34 Table 7-6
The reference to PG&E Transmission Line-Old River Alignment was not deleted as previously requested. Please delete. 27-8

Page 20-2 Table 20-1
Under the CPUC heading, Certificate of Public Convenience and Necessity should be followed with (CPCN). The information under Agency Authority is irrelevant. The CPUC issues CPCNs for electric lines of 200kV and above under its General Order No. 131-C. Whether the service area is noncontiguous or the cost of service expansion is high is irrelevant. Please revise accordingly. Please revise language in the last column as follows: *The 230kV electrical interconnection for project operational power, if it is determined that a CPCN is required.* 27-9

Page 20-8 Table 20-1
The language under the heading Agency Authority in the PG&E column should be revised as follows: PG&E grants permission for activities undertaken within PG&E Rights-of-Way and *agrees* to relocate PG&E facilities. The language under the last column should be revised as follows: Construction of *roadways or facilities* that cross or parallel PG&E *utility Rights-of-Way* and relocation of PG&E facilities. 27-10

Page 20-10
The information under California Public Utilities Commission is incorrect. PG&E is not required to file an advice letter with the CPUC. Notification of construction must be filed with the safety branch 30 days prior to construction. A CPCN is required if electric lines exceed 200kV. 27-11

Mitigation Measures

The Draft EIR/EIS does not address which mitigation measures are specific to PG&E. We understand that construction related mitigation is applicable to PG&E, however, it would be helpful for us and for monitoring purposes if PG&E were specifically named. We anticipate that communication will take place when the exact alignment for the new electric transmission line is finalized. Prior to construction we will need to know which specific mitigation is applicable and who is responsible. 27-12

Thank you for the opportunity to provide comments on this document. Please contact me at 415-973-5769 if you have any questions.

Sincerely,

Elisabeth Brokaw

Elisabeth A. Brokaw
Planning Analyst

LMB(3-5432)

27-1. Comment noted.

27-2. The staff-preferred option for power supply is for dedicated service to be provided from PG&E's existing Brentwood substation on Sellers Avenue to the Transfer Pumping Plant within PG&E's franchise area along Sellers Avenue, Paine Avenue, and Walnut Boulevard. A transformer would be installed at the substation and a 21-kV service line would be extended first via an underground line along Sellers Avenue and then on an existing overhead pole line along the other two thoroughfares. The overhead line would be reconstructed to accommodate both the existing and transfer pumping plant circuits. Because the line would be underground and along existing pole lines, and because the areas through which the line would pass are not environmentally sensitive, no environmental impacts are anticipated.

27-3. A PG&E transmission tower is located at the apex of the hill. CCWD has used this terminology to refer to the site because the hill is otherwise unnamed and has no other distinguishing features.

27-4. CCWD made assumptions regarding the specific electric transmission facilities that would be constructed to serve the Los Vaqueros Project. Wherever appropriate, CCWD made worst-case assumptions to ensure that the impacts of new and relocated PG&E facilities would be fully disclosed in the Stage 2 EIR/EIS. Should the location of facilities change in the future to the extent that new impacts could occur, CCWD would be responsible for any required review under CEQA.

27-5. The 0.08 acre of annual grassland affected refers to the impact of the relocated electric transmission line. Annual grasslands are considered a common plant community and the effects of the project on this community would not be considered a significant impact.

27-6. See response to comment 27-5. The impact acreage for the new transmission line is combined with the acreage affected by the alternate Old River pipelines. These acreages are summarized in Table 7-2 of the Stage 2 EIR/EIS and are discussed for each project alternative on pages 7-22 through 7-26.

27-7. Comment noted. The final EIR/EIS has been modified to reflect this change.

27-8. Comment noted. The final EIR/EIS has been modified to reflect this change.

27-9. Comment noted. The final EIR/EIS has been modified to reflect this change.

27-10. Comment noted. The final EIR/EIS has been modified to reflect this change.

27-11. Comment noted. The final EIR/EIS has been modified to reflect this change.

27-12. CCWD would be responsible for all mitigation measures for relocating the natural gas pipelines and the electric transmission line unless this responsibility is contractually assigned to PG&E.

CCN 17739
EN 13.2.9.5

EAST BAY CHAPTER
Alameda & Contra Costa Counties
California Native Plant Society

May 11, 1992

Mr. Gary Darling
Contra Costa Water District
P. O. Box 4121
Concord, California 94524

Re: **CCWD Draft Stage 2 DEIR for the Los Vaqueros Project**
SCH #91063072

Dear Mr. Darling:

As you may know, the California Native Plant Society (CNPS) is a statewide organization of professionals and laypeople dedicated to the enjoyment and preservation of California native plant resources. The East Bay Chapter of CNPS (EBCNPS) is a 1,400 member chapter whose area of concern is Contra Costa and Alameda counties. Our Conservation Committee has formally reached consensus on this issue and have received Chapter Board approval of that consensus. We appreciate the care with which our first comments on the Vasco Road and utilities relocation DEIR were considered and, as appropriate, incorporated in this document. We believe our comments on the stage 2 DEIR will provide constructive criticism of the Los Vaqueros Project Environmental Review process.

EBCNPS reviewed the DEIR in three areas relating to vegetation -- 1. Identification of the resources and their value; 2. Identification of impacts and their significance; 3. Mitigations and their effectiveness in reducing impacts to less than significant. In the area of resource identification and valuation this DEIR is exemplary. With the reservations expressed within the DEIR itself we consider this aspect of the DEIR adequate to proceed to impact assessment and mitigation. 28-1

Identification of impacts to these resources is thorough with one serious exception. **Should not the specific impacts of possible recreational resource development be identified, assessed and mitigated within this document?** The potential for conflicts between preservation, enhancement, and restoration goals is real, **until these potential conflicts are identified and mitigated is not this DEIR incomplete and inadequate?** Listing this need under the environmental commitments section does not meet the need for CEQA mandated public review. 28-2

Mitigations and their effectiveness require a more complete response. **But first and foremost; why does not this DEIR contain specific vegetation planning and management recommendations to realize CCWD policy requiring "that lands be managed to maintain or enhance existing resource values" (7-17)?** Special vegetation and specific land area zonings provided with short and long term management 28-3

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programs are basic tools to realize this excellent policy. This approach would prevent or reduce conflicts between differing land utilization needs. **Should not special vegetation land area zonings be mapped, identifying areas to be preserved, enhanced, restored or created and the commitment to their long term monitoring and reservation in the form of management plans be contained in this DEIR?**

Mitigations, as the DEIR notes, involving enhancement, restoration or creation of habitats for species or communities are largely experimental or even unattempted to date. CNPS has developed a lively skepticism of such mitigations based on almost uniformly poor success rates. However, the standards and techniques for establishing and the monitoring included in the DEIR are to best current standards. These standards will demand the very best skills available to achieve a measure or success in satisfying mitigation needs. **Should not all enhancement, restoration, creation or purchase mitigation strategies be specifically under the control of a land managing body (i.e. Nature Conservancy) or a private consulting group contracting with CCWD with proven experience in this area of special skills and given with sufficient financial resources to achieve such strategies?** This would be a refinement of the strategy on Page 7 - 43 which names CCWD and EBRPD as possible agencies. While both are excellent resource managers, the special skills and consistent budget availability to realize these mitigation strategies would need careful augmentation and modification of existing agency structures. 28-4

Out of kind/like-value creations as defined in this DEIR do not reduce or mitigate impacts. They are correctly listed as compensations under the environmental commitments section. **Should not the 2:1 purchase and protection of nearby like communities to those being lost be the preferred compensation?** Replacing "apples with oranges" does not mitigate or compensate adequately. 28-5

7 - 16 on 7 - 46 refers to the potential growth inducing impacts of the relocated Vasco Road. The mitigation proposed, Contra Cost County zoning policy, is not in the short or long term CCWD control, and as such is not a mitigation. **Should not CCWD purchase lands or conservation easements parallel with the right of way, dedicate them to open space/preserve use except as would accomodate existing access?** This would minimize future growth impacts. 28-6

Finally, EBCNPS would make the plea that the CCWD would reconsider it's preferred alternative. We appreciate the charge CCWD has to best provide for its service area. We respect the seriousness with which CCWD has examined the alternatives. But Los Vaqueros would destroy the largest known valley oak woodlands and disrupt or destroy our best alkali communities in Contra Costa County. This would be tragic for present and future residents of our area. We urge CCWD to reexamine the EBMUD emergency supply alternatives as being the most environmental sensitive. 28-7

Thank you for considering our comments.

Sincerely,

David Bigham

David Bigham
Local Issues Conservation Coordinator
EBCNPS

28-1. Comment noted.

28-2. CCWD has developed a conceptual recreation plan. This plan was developed taking into full account all sensitive resources in the Kellogg Creek watershed. In addition to avoiding sensitive resources, CCWD has developed recreation development guidelines, contained in Section A-2 of the Stage 2 EIR/EIS Technical Report, that will prevent impacts from occurring. It is important to note that the recreation plan has been developed at the conceptual level. CCWD is confident that the conceptual recreation plan could be implemented without resulting in new significant impacts on sensitive resources. However, if future recreation planning indicates that some sensitive resources may not be avoided, CCWD will prepare and circulate additional environmental documentation to comply with CEQA and adopt appropriate mitigation measures.

28-3. CCWD concurs that a long-term watershed management plan is an appropriate and effective tool for implementing CCWD policies regarding land management. CCWD plans to prepare and adopt such a plan before the public is allowed access to the area. This plan will be designed to achieve CCWD goals regarding vegetation management and will bring together all previous environmental commitments made by CCWD. The plan will identify specific areas to be preserved, enhanced, restored, or created; and will include commitments to long-term protection of these areas.

28-4. As noted in the Stage 2 EIR/EIS throughout the "Mitigation Measures" section of Chapter 7, "Vegetation Resources", creation of certain types of habitats would be experimental and uncertain. The mitigation programs developed in the Stage 2 EIR/EIS for wetlands and oak and riparian woodlands, which are included as appendices to the final Stage 2 EIR/EIS, recognize this uncertainty and therefore propose to mitigate impacts using proven methods. CCWD has conducted a multiyear study of the effects of enhancing alkali wetlands and has documented tremendous success with these techniques.

CCWD will consider entering into arrangements with other land managing entities such as The Nature Conservancy. CCWD has met with representatives of several private nonprofit land managing entities during the development of the Los Vaqueros Project. However, CCWD believes that, with appropriate staff additions, it or the East Bay Regional Park District is capable of managing these sensitive resources.

28-5. Comment noted. The mitigation program developed by CCWD includes out-of-kind/like-value creation *combined with* acquisition, enhancement, or restoration of degraded wetlands of the same type along with acquisition and protection of high-quality wetlands.

28-6. CCWD believes that existing controls on growth in the area surrounding the relocated Vasco Road are adequate to prevent secondary impacts from occurring. CCWD concurs that this measure is not under its control but believes that, consistent with Section 15091 of the State CEQA Guidelines, this measure is under the control of Contra Costa County and has been adopted and is likely to be implemented by the county.

28-7. CCWD undertook an extensive alternatives analysis process before it and Reclamation prepared the Stage 2 EIR/EIS. Several alternatives that relied on an emergency supply from East Bay Municipal Utility District (EBMUD) are considered in CCWD's 404(b)(1) alternatives analysis. CCWD did consider alternatives that included an EBMUD emergency supply component in the State 2 EIR/EIS. Because of inadequacies in the EBMUD system, however, none of these alternatives can provide CCWD with sufficient supply to meet its identified emergency supply needs.

It should be noted that the alkali wetlands affected by the proposed project are not the best alkali communities in Contra Costa County. All high-quality alkali wetlands were avoided through extensive redesign of project features. As part of CCWD's mitigation plan, a large alkali wetland would be acquired for protection and enhancement.

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EN 13.2.9.5

LETTER NO. 29

356
61 lines
Letter
WH-B

CONTRA COSTA COUNCIL

One Annabel Lane, Suite 214
San Ramon, CA 94583
Phone (510) 866-6666
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May 12, 1992

President
Susan McNulty Rainey
Board of Directors
Central Contra Costa
Sanitary District

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Vice President
Communications
James E. Simmons
Corporate Director,
Public Affairs
Tosco Refining Company

Executive Director
Diane Longshore

Board of Directors
Contra Costa Water District
P. O. Box H20
Concord, CA 94520

RE: Comments on Draft Stage 2 EIR/EIS
for the Los Vaqueros Project

Ladies and Gentlemen:

We want to compliment the Contra Costa Water District for its vision and perseverance in the planning and preliminary design phases of the Los Vaqueros Project. The Contra Costa Council strongly supports the project's major goals of improved water supply for the 400,000 residential customers of the District. The Council appreciates the opportunity to make the following comments on the EIR/EIS.

First, to facilitate review of the EIR/EIS by the public, and to secure additional local support for the project, we recommend that a simple, clear executive summary be included. This could take the form of a matrix of relative ranking including costs, environmental factors and social concerns. We believe Jones & Stokes Associates did an excellent job in describing the specific impacts of each alternative throughout the document, and that they would be well suited to prepare the executive summary. 29-1

Second, the EIR/EIS should, as many expected, analyze alternatives for a larger reservoir. Whether or not a larger project is immediately viable, this analysis should be done now so as not to lose the opportunity to analyze these alternatives in a cost effective manner, and to mitigate or preclude delays should other water agencies eventually be persuaded to join in the project. The work supported earlier by the East Bay Municipal Utility District could help establish the maximum storage volume that could be implemented without additional significant environmental effects. 29-2

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Finally, based on our review of the EIR/EIS for both the Los Vaqueros and Kellogg reservoir sites, we believe that a unique opportunity to provide vital storage capacity for Northern California urban water system needs may be irrevocably lost should this project go forward at the capacity currently planned. Expansion of surface water storage capacity at these sites could be accomplished with very minimal additional environmental impact. Moreover, a reservoir with greater capacity would be much more cost effective (Los Vaqueros is $4,400/acre foot of capacity) and less of a financial burden to Contra Costa County ratepayers. 29

Again, the Contra Costa Council supports the Los Vaqueros Project concept and hopes to see it developed to its full potential as soon as possible. If we can be of assistance in any way, please call either Pam Reed, Chair of the Council's Water Task Force at (510) 295-3304 or Diane Longshore, Executive Director of the Council at (510) 866-6666. 29

Sincerely,

Contra Costa Council
Eric Hasseltine
President

EH:im
ccwdlv

cc: Douglas P. Wheeler
David N. Kennedy
Lyle Hoag
Jorge Carrasco
Lori Griggs

29-1. CCWD has undertaken considerable efforts beyond the environmental review process to promote public involvement and education regarding the Los Vaqueros Project and will continue to do so. Although a concise executive summary may have been useful had it been available during review of the draft Stage 2 EIR/EIS, CCWD believes, given the relatively moderate public interest in the project as evidenced by low attendance at public hearings and the low number of comments received, that its continuing public information efforts are appropriate.

29-2. As described in the Stage 2 EIR/EIS and Appendix B of CCWD's Section 404(b)(1) alternatives analysis, CCWD has expended considerable effort to facilitate other agencies' participation in the Los Vaqueros Project since 1985. Benefits to CCWD, other participants, and the environment could be realized from a joint-participation project. CCWD has encouraged and led discussions of regional water management issues and believes that efforts to solicit participation have been extended to all potentially interested parties at the expense of delaying the planning, study, and implementation of the proposed project. All other agencies declined to participate in the Los Vaqueros Project.

29-3. CCWD and Reclamation included the Kellogg Reservoir as an alternative in the Stage 2 EIR/EIS. Although implementing the proposed project would not physically preclude the development of the Kellogg Reservoir, CCWD is unable to fund such an additional project and will be unable to do so for the foreseeable future. In addition, the Kellogg Reservoir Alternative would have to overcome numerous environmental regulatory issues. The reservoir site contains many acres of wetland habitat and numerous special-status plant species populations and provides habitat for the San Joaquin kit fox. Therefore, CCWD and Reclamation do not believe that analyzing the development of the Kellogg Reservoir site is appropriate at this time.

29-4. Comment noted.

CCN 17750
EN 13.2.9.5

LETTER NO. 30

COWELL RANCH
Project

May 8, 1992

Mr. John S. Gregg
Program Manager
Los Vaqueros Project
P.O. Box 4121
Concord, CA 94524

Re: Draft Stage 2 EIR/EIS For
The Los Vaqueros Project

Dear Mr. Gregg:

Thank you for the opportunity to comment on the Contra Costa Water District's (CCWD) EIR/EIS for the proposed Los Vaqueros Project. Based on our review of the Draft EIR/EIS we have the following comments.

1. **The Los Vaqueros Pipeline Alignment Should Be Better Defined**

CCWD has selected the Los Vaqueros Reservoir Alternative with a new supplemental intake at Old River No. 5 site as its preferred alternative. Starting on page 2-6 of the EIR/EIS there is a description of common facilities for the Los Vaqueros Reservoir alternative. The common facilities include the Los Vaqueros Pipeline as shown on Figure 2-2 which would run approximately 12 miles from the Neroly Blending Facilities to the main dam of the Los Vaqueros Reservoir. The EIR/EIS does not define the exact location of the pipeline alignment, yet purports to evaluate sepecific impacts along the proposed right-of-way. Specific environmental and land use impacts will vary depending on the exact location of the pipeline. Therefore, the description of the pipeline alignment should be more precise in order to determine the exact nature of the impacts. 30-1

2. **Alternative Alignments For The Los Vaqueros Pipeline Should Be Evaluated**

The Draft EIR/EIS evaluates five alternative projects, plus six alternate project configurations, yet fails to consider any alternative alignments for the Los Vaqueros Pipeline connecting the Los Vaqueros Reservoir with the Neroly Blending Facilities. Alternative alignments should be evaluated that would minimize the impact of the pipeline on existing and proposed land uses. 30-2

3650 Mt. Diablo Boulevard, Suite 230
Lafayette, California 94549
510.283.4981

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3. **The Los Vaqueros Pipeline Has Enormous Impacts For Both Existing and Proposed Land Uses On Cowell Ranch**

The impacts of the pipeline alignment on the Cowell Property are contrary to the statements in the Draft EIR/EIS set forth on page 12-18. 30-3

The S.H. Cowell Foundation owns a 4,900 acre ranch southwest of Brentwood on which it proposes to construct 7,500 homes. The pipeline alignment runs through the middle of an existing 235-acre granny smith apple orchard, planted in 1986. The proposed pipeline alignment would extend some 2,300 feet diagonally into the orchard and would severely interfere with farming operations in addition to eliminating a significant number of trees. 30-4

The Foundation is currently engaged with the County's Community Development Department in a General Plan Amendment study and rezoning for the entire property as approved by the County Board of Supervisors. Please refer to the Contra Costa County Community Development Department file for information on that review process. The process also involves significant participation by the City of Brentwood. The proposed General Plan for Brentwood includes the Cowell Ranch as a future specific plan area for mixed-use development. 30-5

The preliminary development plan for the Cowell Ranch contemplates a long range program involving several thousand new dwellings, significant space for business and job intensive land uses, comprehensive trails and recreation facilities, together with appropriate civic and educational facilities to support the new neighborhoods. The master planning of this unique property represents a significant opportunity to address wide ranging community needs in east Contra Costa County and the City of Brentwood.

The pipeline right-of-way is proposed to follow an alignment through a portion of the Cowell Ranch that is proposed for higher density housing which is affordable to a broad segment of the community combined with future employment and commercial uses. The alignment proposed by CCWD would run directly through this area, creating a permanent barrier. The harm this alignment would do to the development alternatives for the Cowell Ranch would be enormous. 30-6

Cowell's ability to accommodate the CCWD pipeline is limited primarily by site topography and planning considerations. The area in question is one of two such areas on the Cowell property that are sufficiently flat to allow for environmentally appropriate and cost effective residential and mixed-use development. The rectilinear grid street pattern proposed for this part of the property is laid out intentionally in a north-south/east-west orientation to achieve maximum energy and land-use efficiencies. The proposed pipeline alignment would run diagonally through this village area in direct conflict with highest and best use considerations and sound land use and environmental planning. 30-7

4. **The Pipeline Alignment Alternatives Are Being Limited, In Part, By Self-Imposed Engineering Assumptions**

The key engineering design assumption that underlies the pipeline right-of-way alternatives is that the water must flow by gravity from the staging station just east of Walnut Blvd to the Randall Bold Treatment Plant. This is clearly a sensible approach from a long-range cost and reliability point of view. However, if the design included the possibility of pumping then the narrow and self-imposed topographic limitations for the pipeline could be relaxed and alignment alternatives less injurious to affected property owners could be considered. 30-8

CCWD has chosen not to consider this different approach, despite the fact that massive pumping will be required to convey the water from its source in the Delta (at Clifton Court Forebay or other locations) to the staging site east of Cowell Ranch and to the Los Vaqueros Reservoir itself. The use of pumps for conveying water is common and adequate redundancy can be built into the system to protect against power failure and other malfunctions. The EIR/EIS needs to evaluate a system requiring pumps versus one that relies solely on gravity, and to assess and compare the additional costs against the value of the damages incurred by affected property owners as well as land use and environmental impacts in the area. 30-9

5. **Land Use Impacts Of The Pipeline Should Be Minimized**

As stated in the Draft EIR/EIS on page 12-18 CCWD should be required to coordinate the location of the Los Vaqueros Pipeline with individual landowners to reduce land use conflicts. The EIR/EIS should evaluate alternative alignments to determine which alternative would have the least impact including routes that would be contiguous to other rights-of-way or easements. Alternative routes through the Cowell property should include the following:

a) a route parallel and adjacent to the Delta Expressway;

b) a Walnut Blvd and Marsh Creek Road route; and

c) a route parallel to the P.G&E. power line easement.

30-10

6. **The Width Of The Pipeline Right-Of-Way Should Be Specified**

The Los Vaqueros Pipeline project is described on page 2-12 of the Draft EIR/EIS. The pipeline is described as a 96-inch diameter single pipeline designed to deliver up to 200 cfs of water from the transfer pumping plant to the Los Vaqueros Reservoir and to return water during normal operations at up to 400 cfs by gravity flow from the Los Vaqueros Reservoir to the transfer reservoir and then to the Contra Costa Canal.

The width of the right-of-way is not stated in the EIR/EIS, although it is our understanding that CCWD intends to acquire by condemnation a 125-foot wide right-of-way. The EIR/EIS should evaluate the need for a 125-foot right-of-way versus the impact of narrower right-of-way. We question the need for a 125-foot right-of-way when the project only involves one 96-inch pipe. We think the width of the right-of-way grossly exceeds what is reasonably needed to construct and maintain this facility.

30-11

The EIR/EIS should define and justify the width of the right-of-way required for the construction, maintenance and operation of the pipeline. If additional pipelines or other uses are contemplated they should be identified. All foreseeable uses for the right-of-way should be set forth, including the number of pipelines, other utilities and uses, depth, and maintenance requirements. Other foreseeable uses for the right-of-way should be set forth and their impacts studied. The EIR/EIS should set forth the nature of uses both permitted and prohibited within the right-of-way as well as contiguous to the right-of-way (i.e. parking lots, landscaping, trails, and crossing of the right-of-way) in order to determine the full impact. The proposed location of the pipeline alignment is an impediment to good land use and circulation planning.

7. **<u>The Proposed Pipeline Alignment Is Not Consistent With The County General Plan</u>**

We believe that the pipeline right-of-way as currently proposed is not consistent with the County's General Plan. In support of this we cite as examples the following General Plan policies:

a) From Chapter 5, Transportation and Circulation Element, Policy 5-33 encourages utilities to be grouped together with transportation and drainage corridors, where appropriate. According to this policy, the pipeline should either join the Delta Expressway alignment at the nearest possible point and should follow the Delta Expressway alignment for as long a distance as possible, or follow the P.G.&E. easement which parallels the pipeline right-of-way. 30-12

b) General Plan Policy 3-1, page 3-43 calls for coordination of "... land use policies of the County General Plan with those plans adopted by the cities and special service districts." The EIR/EIS should cite all relevant policy language of the County General Plan and evaluate the proposed project against each such policy.

The important relationship between the County's General Plan and the pipeline location is reconfirmed by Government Code Section 65402. That section requires CCWD to request a finding from the County that the location, purpose and extent of the Los Vaqueros project, which includes the pipeline, is consistent with the County's General Plan. County disapproval of the location of the pipeline may be overruled by the CCWD Board of Directors. However, of course, under Section 65402 and CEQA the EIR/EIS must evaluate the consistency of the pipeline location, in addition to other facets of the Los Vaqueros Project, with the County General Plan, in order to allow the CCWD to make an informed decision mitigating where feasible all significant environmental impacts. Inconsistency of the pipeline location with the policies and provisions of the County General Plan is a significant land use impact. CCWD has an obligation under CEQA to substantially mitigate that impact. On its face, there are inconsistencies with Policies 3-1 and 5-33, among other potential inconsistencies (e.g., Goals 3-A, 3-C and 3-I; Policies 3-6, 7-5 and 7-D). Such analysis is lacking in the Draft EIR/EIS. It should be noted that the East County Regional Planning Commission expressed concern about inconsistencies under the County General Plan between the pipeline location and proposed and long term land uses in the area. A decision was made to continue the public hearing to June 15, 1992, in order to give CCWD an opportunity to resolve such inconsistencies. A copy of Cowell's letter to the Planning Commission is attached for your review and comment.

8. **Implementation Of Mitigation Measures**

CCWD should be required to coordinate the precise alignment of their pipeline with property owners and developers and to ensure that the impacts and mitigations are reviewed in the EIR/EIS in order to reduce conflicts to the extent feasible. Before the EIR/EIS is certified the total cost of a particular alignment, including land acquisition and severance damage should be considered in the cost analysis and not just engineering and construction costs.

30-13

What guarantees exist that CCWD will adopt and implement all appropriate mitigation measures? Who will ensure that the pipeline alignment is properly coordinated with the master planning for Cowell Ranch? 30-14

9. **Impact Of Proposed Takeline On Cowell**

The EIR/EIS does not discuss the impact of a partial taking and the effects of creating uneconomic remnants on the remainder. The EIR/EIS should discuss the effects on land use on the Cowell Ranch for the area between the watershed takeline and Marsh Creek Road/Camino Diablo. The EIR/EIS also does not address CCWD's planned taking of Cowell property for oak tree mitigation. What are the effects of creating an uneconomic remnant between the reservoir take and the oak tree mitigation take? 30-15

The impacts on the Cowell property include, but are not limited to, a division of the two largest developable areas on the Cowell Ranch, diminishing its highest and best use; an unnecessary division of planned communities and villages; a direct interference with arterial road and traffic plans; the creation of rigidity in the land use planning in response to right-of-way location; the desirable north-south street grid orientation will jeopardized; the set back and grid changes create irregular and uneconomic remnants; and the best solar orientation of the buildings will be considerably more difficult. 30-16

In conclusion, the draft EIR/EIS is not a document that will allow the CEQA process to contribute to "informed self-government." The Draft EIR/EIS makes no attempt to analyze the compatibility of the pipeline and its location with respect to current and potential land uses in the area. Common sense would suggest that such an analysis is critical in evaluating the environmental effects of the pipeline, including its compatibility with potential land uses and land use policies, especially given that its proposed location is inside the County's Urban Limit Line. Under the County's General Plan and its 65/35 Land Preservation Plan, higher density urban level development is limited to land 30-17

within the Urban Limit Line. The Cowell Ranch is included in the land inventory for potential development through the year 2010. The pipeline will be a permanent feature in East County. It should be planned with that long-term view in mind, complimenting other land uses in the area, rather than competing with them. CCWD has an obligation to evaluate and mitigate such potential incompatibility through the environmental review process. Unfortunately, it would appear that the pipeline has been located with the idea that other potential land uses in the area and the application of the County's General Plan land use policies will simply have to work around it. Such an approach does not represent thoughtful environmental planning. Impacts of the Los Vaqueros Pipeline as proposed need to be better evaluated, feasible mitigation measures need to be spelled out in the EIR/EIS, and other reasonable alternatives need to be explored to make this environmental review and decision-making process adequate.

Thank you for your consideration.

Sincerely

Gary W. Craft

Gary W. Craft
Project Manager

enclosures

cc: Supervisor Tom Torlakson
Contra Costa County County Development Department
Attn: Harvey Bragdon, Community Development Director
Gagen, McCoy, McMahon and Armstrong
Attn: Mark L. Armstrong

C:\WP51\DOCS\LOS

30-1. To allow the environmental review process to assist project proponents in siting project facilities to avoid and minimize environmental impacts, environmental review must precede final facility design. To fully address all the potential impacts of the Los Vaqueros pipeline, CCWD has evaluated a corridor larger than the proposed size of the facility. Because resource information has been gathered for this larger area, CCWD will be able to adjust the location of the pipeline to avoid and minimize environmental impacts.

The preferred alignment of the Los Vaqueros pipeline is described on page 2-12 and is depicted on Figures 2-2 and 12-2 of the EIR/EIS. The description of the alignment is sufficiently precise to enable the evaluation of impacts and proposed mitigation measures; Cowell Ranch Project comments address site-specific matters that indicate that the Los Vaqueros pipeline has been sufficiently described and depicted to allow impact analysis.

30-2. Neither CEQA nor the National Environmental Policy Act require the project proponent to evaluate alternatives to each facet of a project. The discussion of the alternatives to the proposed project set forth in the EIR/EIS properly considers alternatives to the project as a whole and allows reasoned evaluation.

30-3. It is assumed that the comment refers to page 12-17 of the Stage 2 EIR/EIS, which discusses the impact of the Los Vaqueros pipeline on an existing apple orchard just north of Camino Diablo Road and west of Walnut Boulevard. The EIR/EIS finds this impact to be less than significant because it does not meet the significance criteria outlined on page 12-14.

30-4. The information provided by the commenter does not affect the conclusion that the impact of the Los Vaqueros pipeline on agricultural production is less than significant. No information provided by the commenter substantiates the generalized concern that the pipeline would have a severe impact on the remainder of the orchard. Although no mitigation is required for this asserted impact, mitigation measure 12-1 would require CCWD to locate the pipeline in coordination with developers; this coordination may further ameliorate less-than-significant impacts.

30-5. The configuration of the Cowell Ranch Project is subject to change by land use authorities and various other regulators. Attempting to determine the specific effect of pipeline siting on Cowell's proposed development would require considerable speculation. In the absence of sufficient information, the impact on the Cowell Ranch Project is considered significant. To reduce this impact to a less-than-significant level, the EIR/EIS recommends implementation of mitigation measure 12-1, which requires CCWD to coordinate siting the pipeline with proponents of other projects.

30-6. See response to comment 30-5.

30-7. The EIR/EIS recommends mitigation measure 12-1, which would require CCWD to coordinate with project proponents in appropriately locating the pipeline alignment to avoid impacts on future developments. The mitigation measure does, however, allow CCWD to take into account cost-effectiveness and engineering feasibility.

CCWD believes it has adequately addressed all the relevant land use impacts of the proposed project in the EIR/EIS and believes that the mitigation measures discussed in Chapter 12, "Human Environment", would reduce the impacts identified to less-than-significant levels.

30-8. Evaluating the alternatives suggested by the commenter may provide interesting or helpful information. This fact, however, does not require CCWD to include this information in an EIR/EIS. Studies conducted for these alternative pipeline siting would require speculative analysis, which would delay project implementation at greater cost to CCWD. See response to comment 30-2 and 30-5.

30-9. The concept of replacing the proposed gravity flow facilities with facilities that incorporate pumping to convey water from the transfer facilities to the Contra Costa Canal was considered early in the project planning stages. The concept was rejected for the following reasons:

- The gravity flow in this portion of the system increases its reliability.
- The additional power costs associated with such pumping.
- Alternatives using pumped flows in the area of the Cowell Ranch Project are more environmentally damaging.

As indicated in the response to comment 30-2, it is not necessary to discuss and evaluate alternatives to each component of a project.

30-10. See response to comments 30-7 and 30-8.

30-11. See response to comment 30-2. Although the alignment is subject to final design evaluations and field conditions, CCWD plans to acquire rights to the 125-foot-wide right-of-way. A 125-foot-wide right-of-way is required for construction, operation, and maintenance of the pipeline.

30-12. On June 15, 1992, the East County Planning Commission voted unanimously that the Los Vaqueros pipeline was in conformance with the Contra Costa County General Plan. The consistency of the pipeline is discussed in the EIR/EIS on page 12-7 and in Section D of the Stage 2 EIR/EIS Technical Report.

CCWD believes that the Los Vaqueros pipeline and process for siting the facility are consistent with the goals and policies of the county general plan. Certain general plan goals and policies that relate to CCWD's actions are referenced below (in the order they appear in the Contra Costa County general plan) along with an explanation of CCWD's actions as they relate to the goals or policies.

Contra Costa County General Plan Goal No.	Explanation
3-A	CCWD has expended extensive effort to coordinate with Contra Costa County and local jurisdictions in siting the pipeline along existing and proposed transportation and utility corridors; mitigation measure 12-1 will ensure that coordination with entities continues.
3-C	The Los Vaqueros pipeline will be installed underground and the ground surface above the pipeline will be designed to be compatible with surrounding development.
3-I	This goal has been furthered by CCWD's extensive coordination with local jurisdictions.

Contra Costa County General Plan Policy No.	Explanation
7-D	The cooperative effort of CCWD and local jurisdictions in siting the pipeline has consistently focused on cost-effectiveness, as well as improving the future well being of CCWD's customers.
3-1	By providing additional employment opportunities, implementation of the proposed project could contribute marginally to this goal.
3-6	As discussed previously, CCWD has coordinated extensively with Contra Costa County and local jurisdictions. Implementation of mitigation measure 12-1 will ensure that this process continues.
5-33	As discussed on page 18-4 of the EIR/EIS, Los Vaqueros pipeline has been located, where appropriate, along existing and proposed utility and transportation corridors.
7-5	See explanation for goal 3-A.

30-13. The land acquisition process is described on pages 2-53 to 2-54 of the Stage 2 EIR/EIS and the costs of property acquisition, including an allowance for possible contingencies, such as severance damages, are set forth in Tables 1-4 in Section A-1 of the Stage 2 EIR/EIS Technical Report.

30-14. CCWD will adopt appropriate mitigation measures included in the Stage 2 EIR/EIS when it is certified. CEQA requires agencies to reduce the significant impacts of a project to less-than-significant levels wherever feasible. Assembly Bill 3180 also requires the preparation of a mitigation monitoring plan, which will also be adopted at the time the final EIR is certified.

Reclamation must also prepare a document, known as the record of decision, that adopts and summarizes a monitoring and enforcement program for all mitigation.

30-15. The comment appears to confuse eminent domain procedures with the environmental review process. The impacts of mitigation measures need only be discussed if they result in significant impacts. Since creation of an "uneconomic remnant" does not directly or indirectly cause an adverse physical effect on the environment, the EIR/EIS is not required to address the effect. Neither CEQA nor NEPA are intended to protect against the decline in value of income-producing property.

30-16. See the response to comment 30-15.

30-17. See comments 30-1 through 30-14. CCWD believes that the document represents a good faith effort to inform decision makers and the public of the environmental effects of the proposed activities and identify ways in which environmental damage can be avoided or significantly reduced.

LETTER NO. 31

LEAGUE OF
WOMEN VOTERS
OF THE BAY AREA
An Inter League Organization of the San Francisco Bay Area

cc: JSG
Hutton
Glines
WHB

CCN 17747
EN 13.2.9.5

May 12, 1992

Janice Hutton
Contra Costa Water District
P.O. Box 4121
Concord, CA 95825

RE: COMMENTS ON DEIR/EIS FOR LOS VAQUEROS PROJECT

Dear Ms Hutton:

The League of Women Voters of the Bay Area appreciates the opportunity to submit questions and concerns about the Draft Stage 2 Environmental Impact Report/Environmental Impact Statement for the Los Vaqueros Project. Our questions and concerns are attached.

We understand the District's concerns about its very limited emergency supply and water quality problems. We also believe it is essential that the EIR/EIS adequately reflect existing conditions, adequately identify and assess adverse environmental impacts of the project and mitigation measures to compensate or offset project impacts.

Generally, our concerns focus on adverse impacts to aquatic resources, including wildlife, plant communities and endangered species. We are concerned that the importance of impacts to important natural resources, fish, plant communities and wildlife, tend to be minimized, and that some of the proposed mitigation measures would not adequately compensate for adverse impacts of the project. In many cases descriptions of mitigation measures are too vague to allow evaluation about their feasibility or potentially successful. This is a particular concern for special status species and ecosystems. 31-1

In many instances it is unclear whether or not impacts could be avoided. Avoidance is the preferred mitigation in CEQA. In other cases, the adequacy of a proposed mitigation seems magnified. For example, reducing the loss of 180 acres of mature (150-250 year old) Valley Oaks, or 80% of the Valley Oaks in the watershed, to a level of insignificance simply by plantings at a ratio of 3:1. Each mitigation measure sets a precedent for future projects. If this mitigation is deemed adequate to reduce a loss of such magnitude to insignificant, this will become the standard for future losses. There is almost no conceivable impact to Valley oaks that couldn't be reduced to insignificance by planting a few young trees. We suggest that partial mitigation could be accomplished by the 3:1 planting but that the impact still be 31-2

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500 St.Mary's Road, Suite 14, Lafayette, Ca 94549 • Tel. (415) 283-7093 • Fax 283-2613

recognized as significant and findings of overriding consideration be adopted.

Thank you for considering our comments.

Sincerely,

Fran Packard
President

cc: Local Leagues

LWVBA QUESTIONS ON DRAFT STAGE 2 ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR THE LOS VAQUEROS PROJECT

1. Several of our questions submitted in response to the Scoping do not appear to have been addressed:

- the length of time it would take for the reservoir to be filled initially. 31-3

- a presentation of the flow standards in the SWRCB Salinity Standards document for the Bay/Delta and an analysis of whether the diversions for the Los Vaqueros project would bring Bay Delta flows below those standards. 31-4

- an analysis of whether there is sufficient water in the state, or more specifically in the Bay/Delta system, during dry years to supply all existing water rights holders plus allowing additional water to be diverted without resulting in significant environmental damage. 31-5

2. The discussion on page 1-3 and 1-4 points out that CCWD's emergency peak demand water supply is 3 to 5 days, while other district's have a greater supply. How many other districts, if any, have minimal provisions for emergency? If there are others, give some examples and discuss how these districts manage. 31-6

3. Could a desalination plant be operated to produce less fresh water during winter and spring? Explain why Suisun Bay was chosen as the discharge point for brine. Evaluate the feasibility and impacts of disposing of brine in San Pablo or San Francisco Bays. 31-7

4. In the light of the decline of aquatic species dependent on the Delta, data supporting the accuracy of the following statement (paragraph 4 page 3-1) should be provided: "Over about thirty years, SWRCB decisions have developed permit terms and conditions to protect beneficial uses of Delta Water." 31-8

5. There is substantial evidence that existing diversions from the estuary are contributing to decline of species dependent on the estuary, we do not believe that existing conditions should be considered an acceptable baseline condition. The comparison of potential project impacts against a No-Action Alternative appears to facilitate a conclusion of No Significant Impact. 31-9

6. Data should be provided to substantiate the statement (page 4-5) that "riverine factors are the main cause of winter-run (Chinook Salmon) decline...." As noted in the STR for AQUATIC RESOURCES OF THE SAN FRANCISCO ESTUARY "A high correlation has been shown between outflow and most measures of smelt abundance and survival." Loss of fresh water flows should be identified as a contributing factor in the declines of the winter-run if not other runs. 31-10

7. Decline of fresh-water flows should be identified as a contributing factor in the decline of Striped Bass and Delta Smelt as well. According to the Federal Register notice 50 CFR Part 17, Proposing the Delta Smelt for Endangered Status, "Available data indicate the decline in the delta smelt population has been concurrent with increased human changes to seasonal Delta hydrology, freshwater exports and the accompanying changes in the temporal, spatial and relative ratios of water diversions." and "Since 1983, the proportion of water exported from the Delta during October through March has been higher than in earlier years. These proportionally higher exports have been conducted during the delta smelt's spawning season." The cumulative impact of the proposed diversions on Delta Smelt should be addressed. 31-11

8. The meaning of the following statement (page 4-10) is unclear: "The level of significance depends on the ability of the species to maintain or exceed current production levels through mechanisms that compensate for reduced abundance of earlier life stages." This statement indicates that some or all of the special-status species that would be impacted by the project could, somehow, compensate at other life stages for the adverse project-related impacts. Identify specific species and demonstrate how they would compensate for reduced abundance. This criteria seems to invite an assessment of "no significant impact. 31-12

9. Demonstrate the validity of the assumption for the No-Action Alternative (page 4-11) that "demands for water from the Sacramento River, San Joaquin River and other rivers by all users (would) increase." As in #8 above, this parameter seems to set the stage for reducing the significance of the project impacts. 31-13

10. It seems to us that listing as an endangered species warrants a finding of significance even if the project would cause "a less than 1% decline in mortality" (see Chinook Salmon, page 4-24). Also, even a "slight" contribution to significant Delta-wide cumulative impacts on a candidate species for endangered listing (page 4-30), namely the Delta Smelt, should be significant. The preferred mitigation in CEQA is avoidance. Has an alternative been investigated that would require no increase in fresh water diversion? 31-14

11. The DEIR concludes that the "Impacts of increased diversions (on the Delta Smelt) during winter years would...be largely offset by decreases in diversion ...during dry years" (page 4-30) is not clear and should be explained. 31-15

12. On what basis does the DEIR justify the assumption that the North Delta Water Management Program, the Los Banos Grandes Reservoir, Kern Water Bank, Delta Wetlands project would be implemented. A scenario should be developed evaluating the adverse impacts of the project without these projects. 31-16

13. CCWD proposed to mitigate for impacts on fish populations by increasing production rather than increased survival, or in other words through fish hatcheries. We question the adequacy of mitigating for natural fish populations with hatchery stock. 31-17

14. Page 5-45 cites "preserve riparian vegetation wherever possible" as a mitigation measure for impacts of the water conveyance pipeline construction. This mitigation is so vague that it is meaningless. Estimate how much riparian vegetation could be avoided and how much could not be avoided. 31-18

15. The discussion of Kellogg Creek page 6-4 should indicate that because of California's Mediterranean climate, many or most streams are seasonal. The current discussion could be interpreted to mean that Kellogg Creek is not a significant Creek because it does not flow year-round. 31-19

16. What length of stream habitat would be lost with construction of the reservoir? 31-20

17. More specific information should be provided about the studies used to support the conclusions on page 6-13, that coliform bacteria from gulls that would be attracted to nearby landfills would not be a problem. 31-21

18. The location of the Mt. Diablo manzanita, other special status plant species, Valley Oak and other native trees should be shown on a figure. 31-22

19. We have problems with several of the proposed mitigations. Surveys are not mitigation and should be conducted prior to the DEIR. Why the various adverse impacts to oak trees on page 7-36 (irrigation within the dripline, soil compaction and paving within driplines etc.) cannot be avoided instead of simply minimized is unclear. Protection and enhancement as is proposed as mitigation for the loss of 35.6 acres of blue oak woodland, even if the acreage protected is large, still represents a loss. The discussion should also address why the numbers of native trees that would be lost cannot be reduced. 31-23

20. Paragraph 7 on page 7-17 states that CCWD "will release downstream flows sufficient to maintain wetlands that occur between the Los Vaqueros dam site and Camino Diablo Road." This statement is vague. The DEIR should indicate how these decisions will be made: Who will require these releases, under what authority, according to what criteria and at what point in time? 31-24

21. Comments from the Army Corps of Engineers Regulatory Branch as well as other regulatory responsible and interested agencies (US Fish and Wildlife Service, National Marine Fisheries, CA Dept. of Fish and Game etc.) should be provided. The DEIR should state whether an Alternate Site Analysis been developed and discuss its contents. 31-25

22. A site specific mitigation plan should be included in the DEIR/EIS. 31-2

23. The DEIR/EIS acknowledges that a 100% success rate cannot be guaranteed in replacing alkali marsh (page 7-37). There is insufficient information to evaluate the adequacy of the proposed mitigation for alkali marsh losses. The proposed mitigation location and acreage should be provided. It is not even certain that a suitable location exists or is available. The method most certain to assure adequate mitigation for wetland losses is to construct the mitigation sufficiently in advance of the project so as to assure opportunity for success. 31-27

24. We question whether the proposed mitigation for loss of Northern Claypan Vernal pools, i.e. a combination of in-kind/like-value creation and acquisition and enhancement, would comply with the Corps and EPA wetland mitigation goal: "to provide no net loss of habitat acreage and values." Northern Claypan Vernal Pools are uncommon, and each vernal pool has a unique assemblage of plants. There is no indication that mitigation for the loss of Claypan Vernal Pools is feasible or likely. As stated above, the most certain action would be to construct and mitigation vernal pools prior to destruction of those exiting and require 31-2

25. The DEIR/EIS states that mitigation for loss of riparian woodlands would be successfully created when sapling are establishes and no longer require active management. While this may indicate a successful project, it does not address whether the mitigation adequately compensates for the riparian losses. The mitigation would not be considered adequate until trees are same size and the habitat as complex as the existing riparian habitat. 31-2

26. Sizable populations of six special-status plant species (Mt. Diablo manzanita, brittlescale, San Joaquin spearscale, stinkbell, Diablo helianthella and Brewer's dwarf flax) some representing substantial portions of the total known world populations exist within the project area. The DEIR is vague about how much loss for each species would occur. While the discussion on mitigation (page 7-43) lists a number of criteria for a mitigation plan for special-status plant species, however, it also states that "attempts to establish new (special status plant) populations generally have not been successful." This renders the feasibility of mitigation highly doubtful. What attempts have been made to avoid endangered plant populations? Has the District sought consultation under the Endangered Species Act with the US Fish and Wildlife Service? As above, the best way to assure successful mitigation would be to implement the mitigation prior to the loss, and with sufficient time to assesses its success. 31-3

27. The Los Vaqueros reservoir would inundate an estimated 1,042 Valley Oak trees (180 acres) estimated to be 150 to 250 years old 31-3

(page 7-14), 80% of the of the valley oak woodlands in the watershed. The proposed mitigation for loss of 180-acres of mature (150-250 years) Valley Oaks approximately 1,042, the replacement of sufficient amount to offset short-term and long-term habitat values and acreage losses within 75 years, to be highly questionable and dangerously precedent setting. How can a 150 to 250 years old tree be considered replaced in 75 years? The DEIR/EIS should address the possibility of avoiding the loss of any of these trees.

28. Habitats for at least fourteen special status wildlife species would be affected including over 400 acres of Kit Fox habitat. The standards for mitigation of loss of Kit Fox habitat are low and inconsistent with other projects, including the East Contra Costa Airport which was required to provide mitigation at a ratio of 3:1 acres for Kit Fox habitat loss. We see no reason why this project should not have to meet at least the same standards as others in the area. 31-32

29. The status of consultation with the U.S. Fish and Wildlife Service for endangered wildlife species should be stated. 31-33

30. Should nests of any species of special concern (e.g. Golden Eagle, Burrowing Owl, Yellowthroat) be in the project area, a suggested mitigation is to "establish an appropriate buffer zone." The recommended size of the buffer zone for each species should be stated, and how the buffers would be protected and maintained should be described. 31-34

31. It is unclear whether the mitigations for the Red-legged Frog and Western Pond Turtle are feasible and whether they would adequately compensate for the potential loss of habitat for these special-status species. 31-35

32. The last paragraph on page 10-12 indicates that siltation resulting from dam and reservoir construction and operation is not expected to be a problem because "the watershed is relatively small and most of the reservoir siltation would occur only during the winter and early spring months." The latter point is true throughout the Bay Area and southern California. In a Mediterranean climate, erosion and sedimentation of creek environments occurs during the rainy season, except in tidal creeks. 31-36

33. Best Management Practices are recommended as a mitigation measure for dam and reservoir construction. To enable the public to evaluate the adequacy of this measure, the DEIR should state what best management practices would be used. 31-37

31-13. Demands on Sacramento and San Joaquin River systems are expected to increase in the future as the population of California increases. If new water supply sources are developed or new Delta water quality standards make increases in diversions from the Delta impossible, then conditions would remain as described under the "Affected Environment" section.

31-14. Most fish species are capable of sustaining large losses of some life stages without affecting the adult population. Losses of winter-run chinook salmon and Delta smelt attributable to the Los Vaqueros Project are very minor and, as stated in the EIR/EIS, would not measurably affect adult populations.

As a result of comments received on the EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project, particularly for winter-run chinook salmon. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta during the winter-run chinook salmon's season of highest vulnerability. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta. This operation will allow CCWD to eliminate all diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species.

31-15. The proposed project would result in increased losses of Delta smelt during wetter years, when CCWD would divert additional water to refill the Los Vaqueros Reservoir, and increased survival during drier years, when CCWD would reduce its diversions from the Delta and rely instead on water stored in the Los Vaqueros Reservoir. These increases and decreases in survival offset each other and would not contribute to population declines of the Delta smelt. In addition, CCWD's revised operations generally preclude filling the Los Vaqueros Reservoir between March 15 and May 31.

31-16. The Stage 2 EIR/EIS assumes, for purposes of analyzing potential cumulative impacts, that the referenced projects may be constructed in the future. In addition, as suggested in the comment, both the existing conditions and future conditions analyses in the Stage 2 EIR/EIS assess the direct impacts of the proposed project, assuming that no additional water projects are constructed.

31-17. See response to comment 31-14 above.

31-18. The impact analysis contained in the Stage 2 EIR/EIS assumes a worst-case condition that all vegetation within construction corridors would be affected. The resulting losses and recommended mitigation measures are described in Chapter 7, "Vegetation Resources". The referenced mitigation measure is intended to reduce soil erosion and recognizes the value that riparian vegetation can play in reducing soil erosion.

31-19. Comment noted. The information on page 6-4 is intended only to provide a description of Kellogg Creek, in conventional terms.

31-20. The length of stream channels, including Kellogg Creek, that would be affected by the proposed project is described on page 8-17 and equals 7.7 miles of ephemeral stream channel.

31-21. As described on page 6-13 of the Stage 2 EIR/EIS, CCWD undertook a study of this issue and determined that no potential for effects on drinking water quality exists even under worst-case conditions. The results of this study are summarized in the Stage 2 EIR/EIS. Since there is no potential for significant effects, CCWD believes that adequate information is provided. CCWD will provide copies of the referenced study on request.

31-22. The location of valley oak woodlands within the Kellogg Creek watershed is shown in Figure 7-1 of the Stage 2 EIR/EIS. The locations of other special-status plant populations and significant natural communities are described in Sections C-1 and C-2 of the Stage 2 EIR/EIS Technical Report.

31-23. The Stage 2 EIR/EIS does not describe surveys as mitigation. In some cases, specific facility locations have not yet been identified or it is unclear whether impacts can be avoided. In such cases, a worst-case analysis was conducted and mitigation measures are proposed to ensure that impacts are avoided and minimized as much as possible during the planning and design process and that any remaining impact is fully mitigated.

The impacts to oaks described on page 7-36 are intended to recognize that despite all avoidance efforts, some impacts may occur and mitigation should be identified. Blue oak woodlands are not considered a significant resource in the project area and small losses are not considered significant impacts.

31-24. CCWD will be responsible for ensuring the maintenance of flows downstream of the dam to maintain wetlands, between the dam site and Camino Diablo.

31-25. All comments provided on the draft Stage 2 EIR/EIS are included in the final Stage 2 EIR/EIS. The Stage 2 EIR/EIS heavily references the Section 404(b)(1) alternatives analysis that has been prepared for the project and summarizes its contents and results. The alternatives analysis, which analyzes over 120 alternatives, has been completed and provided to the Corps and other agencies.

31-26. A site-specific wetland mitigation plan has been prepared and is included as an appendix to the final Stage 2 EIR/EIS. A mitigation monitoring plan will be adopted by CCWD when the project is approved as required under CEQA.

31-27. CCWD has consulted extensively with the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency regarding wetlands mitigation planning. The wetland mitigation plan, which is included as an appendix to the final Stage 2 EIR/EIS represents the information developed during that consultation. CCWD has also conducted extensive pilot studies that demonstrate the effectiveness of the mitigation plans.

31-28. The proposed project would affect less than 0.01 acre of northern claypan vernal pool. The wetland mitigation plan proposes to compensate for this impact by creating out-of-kind wetlands to achieve no net loss of acreage and values by enhancing other northern claypan vernal pools in the project area.

31-29. CCWD believes that the proposed mitigation measure adequately defines mitigation responsibilities for CCWD and ensures that impacts will be fully mitigated.

31-30. The Stage 2 EIR/EIS clearly states in several locations (page 7-16, for example) that the proposed project would not result in any impacts on special-status plant species populations. In many cases, this conclusion results from extensive efforts to avoid these resources. In addition, the

biological assessment describes potential effects on special-status plants in detail. Beyond avoidance that was already undertaken, no further mitigation is required.

31-31. See response to comment 31-2. As clearly described in the Stage 2 EIR/EIS, the loss of these valley oak woodlands is unavoidable except through selection of another alternative. Therefore, the Stage 2 EIR/EIS proposes mitigation for this impact.

31-32. The proposed project would result in the protection of over 11,000 acres of suitable San Joaquin kit fox habitat. In addition, CCWD has agreed to acquire and protect an additional 1,000 acres outside and east of the Kellogg Creek watershed. Additional details regarding mitigation for wildlife species is contained in the biological assessment.

31-33. Consultation under the federal Endangered Species Act is completed. The biological opinions are summarized in Chapter 20, "Consultation and Coordination".

31-34. The precise extent of any buffer zone is variable depending on site-specific conditions. CCWD is committed to ensuring that appropriate buffer zones are established and that significant impacts are avoided through consultation with a qualified wildlife biologist and implementation of specific recommendations.

31-35. CCWD believes that the referenced mitigation measures are adequate to reduce impacts on these species to less-than-significant levels. Additional detail on these mitigation measures is contained in the biological assessment.

31-36. Comment noted.

31-37. Dam and reservoir construction and operation are closely regulated by the California Department of Water Resources' Division of Safety of Dams. CCWD is engaged in extensive coordination with division and will comply with all applicable provisions of state and local law and regulation.

24 April 1992

CCN 17302
EN 13.2.9.5

LETTER NO. 32

Hunter
6 lines
Blackmer

Contra Costa Water District
PO Box 4121
Concord, CA 94524

Gentlemen

I am writing regarding the DEIR/EIS for the Los Vaqueros Reservoir. As the Chairman of the SAVE OUR HILLS organization in San Ramon I have reviewed this document and have several comments to make

1. Your document takes the position that there will be significant growth inducing consequences of this project. I find this hard to believe, since water availability so close to the planned expansion of the Dougherty and Tassajara Valleys would be mighty tempting. As of this writing, the Dougherty Valley future development of approximately 10,500 homes does not have a water supplier source. I think Los Vaqueros would solve this problem, don't you? Your EIR needs needs to evaluate more fully the growth impacts in this region of Contra Costa County, addressing these projects by name 32-1

2. Relocation of Vasco Road to accommodate this project could possibly be growth inducing to areas West of the project, such as the Brentwood and Oakley areas. I am also concerned that the new routing of Vasco Road is in the vicinity of the talked about Toll Road Project, and would hope that the Toll Road would not be the replacement for Vasco Road. I would like to see more evaluation done on possible growth inducements relative to road relocations. 32-2

3. I might draw your attention to the fact that a similar mistake was made by not fully exploring growth inducing impacts of the Super Sewer. I understand that a lawsuit against the Tri-Valley Wastewater Authority brought by the Sierra Club/Greenbelt Alliance/PARC was successful in that the courts ordered a new EIR be prepared which fully addressed the growth inducing affects of the project. 32-3

Thank you for your attention

Sincerely,

Harold Bushaw

Harold Bushaw
9710 Tareyton Ave
San Ramon, CA 94583
(510) 828-0777

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32-1. The Los Vaqueros Project has been sized to provide water quality and reliability benefits to CCWD's existing service area in northern and central Contra Costa County. The Los Vaqueros Reservoir would not increase the supply of water available to CCWD and would therefore not increase the likelihood that CCWD would provide CVP water service outside of its existing service area.

32-2. The potential growth-inducing impacts of relocating Vasco Road were fully described in both the Vasco Road and Utility Relocation Project EIR and the Stage 2 EIR/EIS. The conclusion of each of these documents is that relocating Vasco Road is unlikely to result in substantial new growth because of the remoteness of the area and current zoning and land use restrictions. The Stage 2 EIR/EIS did identify that small-scale growth potentially induced by the project could result in significant impacts on vegetation resources. Mitigation measures were identified to reduce this impact to a less-than-significant level.

The relocation of Vasco Road is not associated with the development of any toll road. In a letter to Betty Boatmun, former president of the Contra Costa Water District Board of Directors, the California Toll Company stated "It is our conclusion that the [Vasco Road and Utility Relocation] project, as certified, is not consistent with the transportation services that the Mid-State Tollway will provide." In addition: "For reasons given, we have urged CCWD to pursue its project planning independently and leave regional transportation planning to the respective County agencies."

32-3. CCWD believes it has fully complied with the State CEQA Guidelines regarding the treatment of growth inducement of the proposed project and alternatives.

LETTER NO. 33

state water contractors

555 Capitol Mall, Suite 725 • Sacramento, CA 95814-4502
George R Baumli, *General Manager* (916) 447-7357 • FAX 447-2734

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Wallace G. Spinarski
Antel...

CCN 17828
EN 13, 2.9.5

cc: JSL
JH
HG
WHB

May 21, 1992

Mr. Gary Darling
Contra Costa Water District
P.O. Box 4121
Concord, CA 94524

RE: COMMENTS ON THE FEBRUARY 1992 DRAFT STAGE 2 EIR/EIS FOR THE LOS VAQUEROS PROJECT, CONTRA COSTA WATER DISTRICT

Dear Mr. Darling:

As we understand, the Preferred Alternative, Los Vaqueros Reservoir with the Rock Slough/Old River No. 5 intake, would include construction of a 100,000 acre-foot (AF) reservoir and a new supplemental intake located in the Delta on Old River north of Highway 4 and adjacent to Victoria Island. The purpose of the proposed project is to improve the quality of water delivered to Contra Costa Water District (CCWD) customers, to improve the reliability of water delivery by providing emergency storage, and to develop and construct the necessary facilities to have the program operational by 1995 with an estimated cost to CCWD in 1988 dollars of $350 million. The proposed program would allow water deliveries to CCWD under a water service contract with the Bureau of Reclamation to increase from 130,000 AF/year to 195,000 AF/year. 33-1

The State Water Contractors (SWC) support the concept of increased off-stream storage that can provide benefits to water quality, water supply reliability, and the environment. However, we are concerned about the potential impact of the proposed Los Vaqueros Project on State Water Project (SWP) operations, involving the Delta. It is the position of the State Water Contractors that any such impacts must be mitigated. 33-2

The SWC understand CCWD's need to improve water quality and water supply reliability, and accordingly, supports the first two of the project's three primary objectives. However, the SWC is concerned that seemingly artificial limits imposed in the project's third primary objective -- specifically to construct the project by 1995 within an estimated cost of $350 million -- may preclude development of a program which sufficiently mitigates for current and future impacts on Delta resources and water uses. 33-3

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While development of facilities that adequately mitigate environment impacts may be costly, limiting a project's overall cost may significantly affect the ability of the proposed program to adequately mitigate environmental impacts. Similarly, requiring that a project be completed within a specific short time period may require the sacrifice of greater environmental benefits.

- o While there may be compelling reasons to construct Los Vaqueros Reservoir prior to 1995 and for less than $350 million, the technical reasons supporting such a goal need to be clearly identified in the Final EIR/EIS to ensure that the project does not inadvertently circumvent the needs of the Delta environment and other uses of water from the Delta.

- o CCWD should consider increasing the size of the new supplemental intake and increasing the capacity of the facilities necessary to fill the reservoir. Increasing the capacity would reduce the duration of pumping in the Delta. By doing this CCWD would maximize the ability to capture high-quality water and minimize the impacts associated with diverting water from the Delta during periods which are more sensitive to fisheries. 33-4

One of the alternative intake alignments identified in the draft EIR/EIS contemplates a connection with Clifton Court Forebay. The Department of Water Resources' (DWR) South Delta Water Management Plan (SDWMP) Draft EIR/EIS suggested the relocation of CCWD's Contra Costa Canal Intake to Clifton Court Forebay would provide CCWD with greater operational flexibility and improved water quality.

- o The SWC recognizes that it may not be currently practical for CCWD to interconnect its new supplemental Delta intake facilities with the existing Clifton Court Forebay. However, CCWD should consider, as an alternative, staging construction of an intake so that the facilities may be relocated to an enlarged Clifton Court Forebay in the future. This alternative should also recognize that other Delta water transfer facilities are being investigated by DWR as part of the Governor's State Water Policy, and that such facilities could provide CCWD with an alternative means to meet its objectives and provide significant additional benefits. 33-5

The draft EIR/EIS shows in figure 2-3 and states on page 1-10 that the project will enable CCWD to increase annual diversions from 120,000-130,000 AF under existing conditions to 174,600-188,000 AF under full build-out demands. However, the EIR/EIS also states that consistent with CCWD's Resolution No. 88-45, one objective considered in developing the Los Vaqueros Reservoir Project was to, "Not operate ... [to] increase the export of Delta water from northern California without additional voter approval." There appears to be an inconsistency between the projects purpose and the stated objectives. 33-6

- o The Final EIR/EIS should identify that one of the primary objectives is to divert more water from the Delta to increase CCWD's ability to meet increased water demands.

DELTA-WIDE WATER MANAGEMENT

The Sacramento-San Joaquin Delta (Delta) is a complex region through which two-thirds of all of California's developed water supplies are transported and where diverse habitat exists for a variety of biological resources. Consequently, programs that increase water diversions from the Delta can have a significant impact on many existing Delta uses. The following concerns identify Delta water management issues which must be clarified or addressed in the EIR/EIS.

Project Description and Operations Need to be Clarified

The draft EIR/EIS states that, "Reservoir filling would occur when surplus water of adequate quality is available in the Delta between November 1 and June 30." It also states that, "when diverting water to the Contra Costa Canal for direct use, CCWD would give preference to the intake that could deliver the best water quality."

- The phrase "surplus water" should be defined.

33-7

- The EIR/EIS should identify the projected diversions for the alternatives considered from both the Rock Slough and new supplemental intakes. This information should include projected monthly diversions: from the new supplemental intake to fill Los Vaqueros Reservoir, from the new supplemental intake directly to the Contra Costa Canal, and from the Rock Slough Intake. The EIR/EIS should also indicate the projected change in quantities of diversions from current levels.

Diversions to fill Los Vaqueros Reservoir would correspond with the period in which other Delta users have a high demand for Delta water. Diversion by the SWP and CVP are highest during the winter and spring months. In addition the SWP has proposed utilizing increased pumping capacity to divert excess Delta outflow during this period to store water in south of the Delta storage programs such as Los Baños Grandes and the Kern Water Bank. Further, the winter-run Chinook salmon requirements may constrain the availability of high-quality water during this period and conflict with reservoir filling operations.

33-8

- The Final EIR/EIS should include information which demonstrates that there will be sufficient water available to fill the Los Vaqueros Reservoir when all demands on the Delta are considered.

The EIR/EIS states that diversions to fill the reservoir will take place through June 30 when adequate water quality is available. The SWC is concerned that there may be significant adverse impacts to Delta fisheries from increased CCWD pumping in May and June. These impacts would further degrade Delta fisheries and consequently could increase the restriction on SWP operations to divert water from the Delta. As you are aware the SWRCB has severely restricted SWP and CVP diversions in May and June to reduce project impacts on Delta fisheries. Additional limitations may be placed on the SWP and CVP in other months with interim standards to be adopted by the State Water Resources Control Board.

33-9

- o The EIR/EIS should identify how the Los Vaqueros Reservoir project would be impacted if similar limitations are placed on its operations. Also, the impact on SWP operations due to operations of the Los Vaqueros Project should be identified.

- o The EIR/EIS should identify the effect of pumping on Delta fishery resources, particularly during periods when the SWP and CVP are subject to restrictions, and should discuss what restrictions may be applied to CCWD's proposed program during those crucial months.

As a leader in the Best Management Practices (BMP) process, CCWD played a key role in developing a statewide conservation strategy to reduce future water demands. However, it is unclear how BMP's and other conservation strategies will be incorporated into Los Vaqueros Project. 33-10

- o The EIR/EIS should identify what steps are being taken by CCWD, and cities within its service area, to reduce water demand.

Impact Analyses Need to Be Revised

To determine the effect of the proposed project on Delta resources, several computer models were used. DWR's Central Valley Simulation Model (DWRSIM) was used to determine changes in reservoir storage, river inflows, Delta inflow, Delta outflow, and Delta exports. Information from DWRSIM was used in the Fisher Delta Models to calculate flow and TDS distribution in the network of Delta waterways. 33-11

- o Demands for SWP contractors, excluding the Feather River contractors, used as input to the DWRSIM model runs under future conditions (year 2000) were 3.7 million acre-feet (MAF) per year. The SWP contractors' total requests, excluding the Feather River contractors' requests, were 3.6 MAF in 1992, and will likely exceed 3.7 MAF by the year 1993. The underestimated SWP year 2000 demand might result in underestimated impacts on Delta hydrodynamics, fisheries, and water quality. A modeling run with higher, more representative demands should be made. Our estimate for the year 2000 SWP demand is 3.9 MAF.

Chapter 18 "Cumulative and Growth Related Effects" neglects to identify the cumulative impacts of the proposed Los Vaqueros Project when operated in conjunction with future SWP facilities. However, Chapter 3 "Delta System Hydrodynamics", Chapter 4 "Delta System Fisheries Resources", and Chapter 5 "Delta System Water Quality" contain discussions of the environmental consequences under cumulative future conditions. In these discussions, it is unclear what studies are being examined for the particular alternatives. 33-12

- o The Cumulative Effects Section of the EIR/EIS should include analyses that show the effects of the preferred alternative when operated in conjunction with other future SWP facilities. Future SWP facilities should include south Delta facilities, Los Baños Grandes Reservoir and the Kern Water Bank. The cumulative impact analysis should include evaluation of the effect of the proposed project in combination with these SWP facilities that will be competing for the same surplus and high quality water.

Impacts on State Water Project Not Adequately Addressed

The SWC is concerned that the increased diversions from south Delta channels for the Los Vaqueros Project could have an adverse effect on State Water Project (SWP) water operations; however, such impacts are not presented in the draft EIR/EIS. While the draft EIR/EIS presents the change in simulated storage volumes for CVP reservoirs (Shasta, Clair Engle, and Folsom) and simulated river flows immediately downstream of those reservoirs, no information is given regarding potential impacts on SWP operations. 33-13

- The draft EIR/EIS should be expanded to include the evaluation of potential impacts on SWP deliveries and operations including Oroville, Clifton Court Forebay, Harvey O. Banks Delta Pumping Plant and SWP storage in San Luis Reservoir. The draft EIR/EIS should also include evaluation of the potential increase in carriage water requirements for both the SWP and CVP.

It is our understanding that the Delta channels in the vicinity of the proposed Supplemental Intake and the SWP's Clifton Court Forebay are at capacity when the SWP is diverting at the maximum rate allowed by the existing Corps of Engineers' Section 10 Permit. We are concerned that the relative proximity of the proposed intake to DWR's proposed South Delta facilities and to the existing Clifton Court Forebay could result in channel capacity constraints. 33-14

- The draft EIR/EIS should identify the cumulative impacts associated with operations of the existing and an enlarged Clifton Court Forebay in combination with CCWD's New Supplemental Intake on Old River. The draft EIR/EIS should also identify the measures which CCWD would undertake to mitigate any impacts.

The SWC is concerned about the Trihalomethane Formation Potential (THMFP) of SWP water diverted from the Delta, and any related impact on water treatment cost and human health. In the draft EIR/EIS, evaluation of impacts on water quality are based on the simulated Delta salinity defined in terms of chloride concentration and electrical conductivity. The draft EIR/EIS neglects to identify any changes in the THMFP which may occur as a result of changes in the flow patterns in south Delta channels when the Los Vaqueros Project is operated. 33-15

- The EIR/EIS should address water quality impacts relating to changes in the THMFP in the Delta.

Mitigation Should be Clarified

As an organization which represents water agencies that depend on water diverted from the Delta, the SWC is concerned about declines in fishery populations in the Delta. The need to develop adequate solutions to protect the Delta fisheries has been underscored by recent restrictions that have been placed on the SWP's operation of the Harvey O. Banks Delta Pumping Plant to protect the endangered winter-run chinook salmon. Accordingly, the SWC believes that all proposed projects, which would increase diversions from the Delta, must 33-16

attempt to minimize significant fishery impacts and include adequate mitigation programs for unavoidable impacts.

- The draft EIR/EIS shows in addition to its existing intake the new supplemental intake would be used to meet future increased demands when surplus water is not available. The net effect would be that CCWD would divert more water from the Delta during all months of the year (see Figure 2-3 of the draft EIR/EIS). The EIR/EIS should identify how increases in reverse flows would impact fishery resources and how the impacts will be mitigated.

- The EIR/EIS states that CCWD could appropriately contribute to programs considered as mitigation under the No-Action alternative to offset specific impacts to striped bass and Delta smelt. Mitigation measures for fishery impacts under the No-Action alternative consist of programs that CCWD would have no direct discretion to carry out. The EIR/EIS should identify the process regarding how CCWD will ensure that such mitigation is carried out and what mitigation programs will be developed to mitigate fishery impacts in the absence of the No-Action mitigation.

It is the SWC' experience that regulatory agencies may not issue the necessary operational permits unless there is an agreement to mitigate for existing impacts as well as the impacts associated with increased operations. For example, before the Harvey O. Banks Delta Pumping Plant may be operated at full capacity, an agreement with DFG to mitigate for existing indirect Delta fishery impacts must be executed.

33-1

- The EIR/EIS should recognize that in order to obtain the necessary permits to allow CCWD to increase diversions from the Delta, existing impacts should be mitigated. Accordingly, it is expected that fish screens will be required at the Rock Slough Intake. Because such mitigation will most likely be required, the EIR/EIS should identify such measures to minimize the existing impacts.

The Draft EIR/EIS states that CCWD would contribute to the ongoing fishery mitigation programs, such as those developed under the Two-Agency Fish Agreement. The SWC is encouraged that CCWD is committed to participating in mitigation programs such as the Two-Agency Fish Agreement. The EIR/EIS suggests contributing to ongoing fishery mitigation programs would serve as adequate mitigation.

- While the Two-Agency Fish Agreement may serve as a model, it was intended to specifically mitigate SWP impacts. The SWC believes that it would be inappropriate for CCWD to satisfy its mitigation requirements by contributing to this agreement. The EIR/EIS should specifically describe programs to offset fishery impacts. Such programs should include construction of fish screens on the existing Delta diversion intake. Further, CCWD should coordinate with the appropriate fish and wildlife agencies (i.e. Department of Fish and Game) and engage in negotiations to develop its own mitigation agreements for impacts associated with CCWD's existing operations in the Delta as well as operations of the proposed project.

33-18

- o It should be recognized that mitigation programs such as the Two-Agency Fish Agreement may be insufficient to mitigate for the impacts to threatened and endangered species. This was evident in 1992 when SWP and CVP Delta pumping was curtailed. The EIR/EIS should identify what measures will be implemented to avoid impacting winter run salmon when conditions such as those experienced in 1992 occur.

The State Water Contractors appreciates the CCWD's need for the proposed Los Vaqueros Project, and are pleased to note the District's recognition that success of that Project is linked to successful resolution of Delta fisheries and water quality problems. The State Water Contractors look forward to a closer, more cooperative, effort with the CCWD and Contra Costa County in working toward a mutually beneficial solution to Delta problems.

The State Water Contractors would be pleased to participate in a meeting with policy representatives of DWR, USBR and the CCWD to discuss possible joint cooperative efforts in the Delta. We appreciate the opportunity to comment on the Draft EIR/EIS.

Sincerely,

Thomas Gamble

for George R. Baumli
General Manager

cc: SWC Member Agencies
David Kennedy, DWR
Roger Patterson, USBR

33-1. The proposed project would not materially increase CCWD's ability to deliver water from the Delta to its service area. While the proposed project would eliminate the need to make improvements to a portion of CCWD's water conveyance system, major restrictions would still exist in the Contra Costa Canal system that would limit CCWD's deliveries to approximately existing conditions.

33-2. Comment noted. CCWD concurs that increased offstream storage can provide numerous benefits and believes that the proposed project achieves these objectives while minimizing environmental impacts and impacts on other water users. Analyses conducted for the Stage 2 EIR/EIS did not identify any potential impacts on State Water Project operations.

33-3. CCWD does not believe that its timing and cost objectives preclude the development of a program that minimizes environmental impacts. CCWD believes that it is imperative to proceed with project development given the vulnerability of its water supply, which serves over 400,000 people and numerous industries, to a major Delta catastrophe. CCWD also considered projects in the Stage 2 EIR/EIS that substantially exceeded its cost objective and that could not meet its timing objective. Through analysis contained in the EIR/EIS, CCWD identified that the proposed project would be the least environmentally damaging practicable alternative.

33-4. As a result of comments received on the draft EIR/EIS and meetings with the various resource agencies, CCWD and Reclamation have developed mitigation measures that not only reduce impacts to Delta resources, but actually improve conditions as compared to no project, particularly for winter-run chinook salmon. These measures consist of revisions to the proposed project operations in terms of the timing and magnitude of diversions from the Delta. Under the proposed mitigation plan, CCWD will use a portion of the water stored in the Los Vaqueros Reservoir in lieu of direct diversions from the Delta during the winter-run chinook salmon's season of highest vulnerability. This operation will allow CCWD to eliminate all its diversions from the Delta, including those from its existing intake at Rock Slough, for a total of approximately 30 calendar days between March 15 and May 15 of each year. In addition, CCWD will generally not fill the Los Vaqueros Reservoir between March 15 and May 31.

The revised project operations are fully described in the biological assessment for the proposed project as are the effects of the revised operations on special-status fish species. The mitigated operations are also described in Chapter 4 of the final Stage 2 EIR/EIS, along with a discussion of effects on other fish species.

33-5. CCWD recognizes that numerous other programs are being investigated by various agencies. At such time as those future projects are approved and receive environmental clearance, CCWD will consider coordinating with other appropriate agencies to determine if coordination with those other projects could provide significant benefits to the Delta and CCWD. CCWD and DWR have coordinated extensively on these and other issues over several years.

33-6. See response to comment 33-1 above.

33-7. Surplus water is defined as that quantity of water that is in excess of water needed for consumptive uses or to meet water quality standards and that is available for diversion. Typically, surplus flows occur when upstream reservoirs are required to release water to maintain flood control storage.

Figure 5-12 of the biological assessment, provided at the end of responses to comments of the State Water Contractors, provides the remaining information requested in this comment.

33-8. CCWD has a contract with Reclamation to deliver up to 195,000 acre-feet per year. CCWD will continue to rely on this contract to provide most of its water supply, and will divert surplus water, subject to certain conditions, to help meet its water quality and emergency supply needs. Therefore, diversions to fill the Los Vaqueros Reservoir are unlikely to affect the operation of other existing or future projects. See also responses to comments 2-9 and 2-19.

33-9. See response to comment 33-4, above. In addition, CCWD's proposed operational mitigation measures include no filling of the Los Vaqueros Reservoir during May. While the operations do allow the filling of the reservoir in June, surplus water of sufficient quality is available in June only during very wet years. While CCWD may desire to use previously stored CVP water to fill the Los Vaqueros Reservoir during June, Reclamation will retain the ability to decide when CVP water may be released for rediversion by CCWD. Also, according to modeling results, water quality is typically higher during July and August than June, and CCWD is therefore likely to divert water during those months.

33-10. CCWD's water conservation programs are summarized briefly on page 1-7 of the Stage 2 EIR/EIS. As indicated on page 1-6 of the Stage 2 EIR/EIS, significant additional detail is contained in CCWD's Section 404(b)(1) alternatives analysis.

33-11. The State Water Project demands used in the studies were 3.167 million acre-feet (MAF) (representing existing conditions), 3.782 MAF (representing future conditions) and 4.224 MAF (representing future cumulative conditions). The years (1990, 2000, and 2025) associated with these levels were included as references to the source of the estimates. The current estimates of when these demand levels will be reached is neither important nor relevant to the analysis. The analyses cover a full range of demand levels for future conditions and therefore cover likely impacts regardless of the specific predictions of when these levels will actually be attained.

As discussed in the Stage 2 EIR/EIS, project deliveries and demands are not the same. While demand levels increased about 600,000 af from the existing conditions scenario to the future scenario, estimated average deliveries increased by only about 100,000 af. This is because of existing physical, hydrological, and regulatory constraints. Large increases in demands do not necessarily result in large increases in exports. Environmental impacts in the Delta are more closely linked to Delta exports than to project demands.

33-12. As described on page 18-2 of the Stage 2 EIR/EIS, cumulative impacts on Delta water resources and fisheries are discussed in the respective technical chapters. The approach to hydrologic and hydrodynamic modeling for cumulative conditions is described on pages 1-10 through 1-12. CCWD and Reclamation believe that the Stage 2 EIR/EIS fully and adequately describes the cumulative impacts of the proposed project in conjunction with other future projects. See also response to comments 2-9 and 2-19.

33-13. Tables giving summaries of effects on the State Water Project are included in the Los Vaqueros Project files, available for review from CCWD. Information from the model runs is summarized below.

The studies show that the alternatives have a negligible effect on the SWP operations, reservoir levels, and deliveries. Deliveries changed in a very small number of months. The largest monthly decrease in exports (one case of 11,000 af) was preceded by an increase of a like amount. A net reduction of 3,000 af in deliveries over 57 years (50 af/yr average) was calculated in the future case; when the accuracy of the model was considered (+/- 5,000 af in any month), this is not different than zero. The net deliveries did not change in the existing conditions scenario.

The project does not cause an increase in carriage water. The project tends to increase CCWD diversions when there is surplus flow and to decrease them when the Delta is in balanced conditions. The studies showed the largest monthly change in carriage water under existing conditions was a decrease of 4,000 af. Of the 10 months with changes, eight involved changes

of less than 1,000 af (i.e., within the roundoff accuracy and very much smaller than the accuracy of the carriage water model).

Months with increases in carriage water greater than 1,000 af (1 month under existing conditions, 4 months under future conditions) were associated with increases in exports at the Banks pump plant and/or at the Tracy pump plant. The largest increase was 5,000 af (future conditions). Again, this is much smaller than the accuracy of the carriage water model.

33-14. The proposed new intake would have a capacity of 250 cfs. The greatest impact would be in the vicinity of the intake. If there were no tides, one would expect an increase in velocity on the order of 0.3 inches/second. Tidal action reduces any impacts of this small change because this level of pumping would be seen as a slight phase shift and distortion of the tidal flows. (Note that 250 cfs is about 2.5% of the combined peak SWP and CVP pumping capacity at the Banks and Tracy facilities.) Impacts would be correspondingly negligible.

The effects of a new enlarged forebay cannot be determined unless and until the forebay size, location, and operational rules are determined.

33-15. Trihalomethane formation potential (THMFP) is largely affected by dissolved organic compounds and bromide concentration.

The project would neither affect nor change organic loading in Delta channels. The changed inflows caused by the project are too small to cause significant changes in organic concentrations. Therefore, this portion of the THMFP problem would not be affected by the proposed alternatives.

Bromide concentrations will change in proportion to chloride levels (1 mg/l chloride translates to about 0.003 mg/l bromide). Most increases in chloride levels identified in the EIR/EIS result from increased exports by the SWP and from operational changes necessary to meet increased SWP demands. These may result in significant increases in THMFP and may have adverse impacts on municipal water supplies.

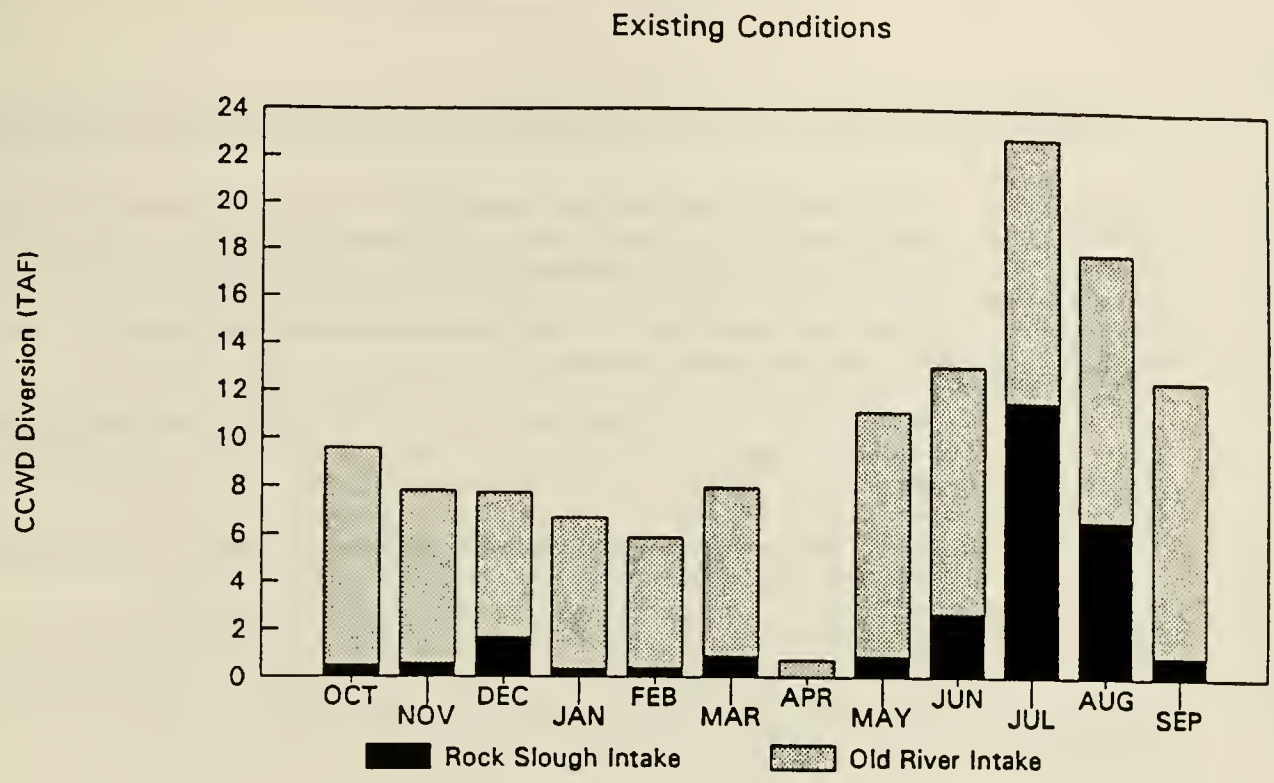
The chloride increases associated with the preferred alternative would be small, infrequent, and are not significant. Consequently, any bromide increases related to the preferred alternative are expected to be small, infrequent, and not significant.

33-16. See response to comment 33-1. The mitigation measures described under the No-Action Alternative are not proposed to be implemented by CCWD. As described on page 4-51 of the Stage 2 EIR/EIS, these mitigation measures are described solely in accordance with NEPA and CEQA, to provide a clear distinction between those impacts and related mitigation measures that result from changes in background conditions as compared to those impacts that are a direct result of implementing the project alternatives.

33-17. The biological assessment for fish species for the Los Vaqueros Project fully addresses the existing losses of fish at CCWD's Rock Slough intake. There are two important points regarding the Rock Slough intake. First, the Los Vaqueros Project would, through its normal operations, reduce diversions through Rock Slough by 50-80% and instead divert that water through a screened intake on Old River where fish can be more efficiently screened.

Second, only a very small portion of losses associated with CCWD diversions are attributable to entrainment. By far the greatest proportion of losses, although still very minor compared to Delta-wide losses, result from changes in Delta flow patterns that are negligibly influenced by CCWD diversions. Also, a substantial proportion of impacts affect fish species and life stages that are too small to be screened, such as larval Delta smelt and striped bass.

33-18. See response to comment 33-4.



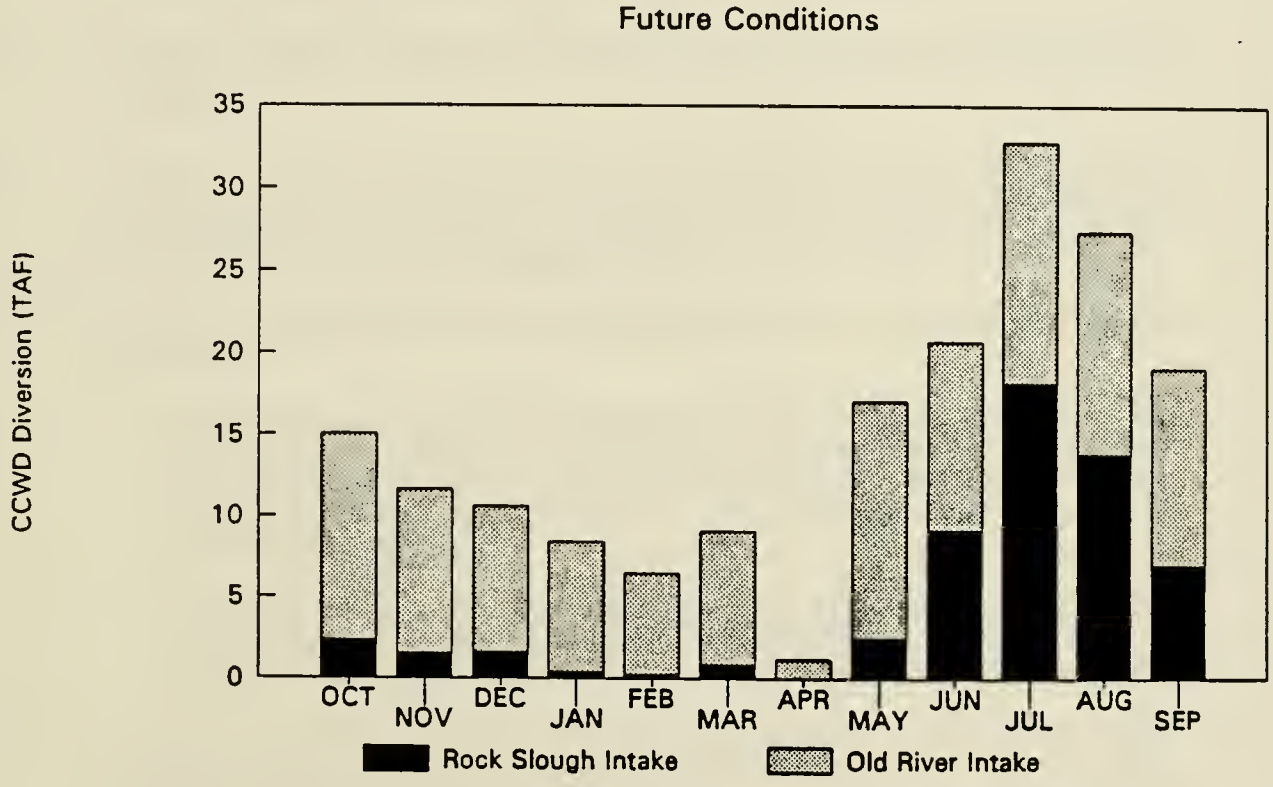


Figure 5-12. Average CCWD Diversion at Rock Slough and Old River Intakes

PH1-1 Much of the agricultural runoff that enters the San Joaquin River contains selenium that, in high concentrations, has been shown to adversely affect life forms. How does CCWD plan to keep selenium out of the reservoir?

PH1-2 Access to the reservoir recreation facilities appears to be only from the south. Are Alameda County residents funding the project?

PH1-3 The draft Stage 2 EIR/EIS states that CCWD now has between 3 and 7 days of emergency storage. How many additional days of emergency storage would the Los Vaqueros Reservoir provide?

PH1-4 Why isn't desalination being given more consideration? Desalination could provide water for California's future growth and we could implement desalination now.

PH1-5 CCWD has not looked at relocating Vasco Road but is relying on construction of a proposed toll road that would connect Suisun and Sunol. What would be the long-term costs? If a toll road is constructed, property values in this area would fall.

PH1-1 Selenium occurs naturally in Central Valley soils and is leached into the San Joaquin River largely through agricultural irrigation practices. Although selenium levels in the Delta are very low because the flows in the San Joaquin River are higher during winter and therefore the dilution factor is greater, levels of selenium in the river are lower. Because the Los Vaqueros Project would involve diverting less water during low-flow periods and a greater percentage of water supplies during higher flow periods, the overall level of selenium in CCWD supplies would be lower, assuming that future levels of selenium in the San Joaquin River do not increase.

In addition, CCWD would regularly release water from the reservoir to maintain a water quality goal for the reservoir of 65 mg/l chloride and 50 mg/l sodium. Selenium would also be reduced in proportion to these water quality parameters.

CCWD water supplies now diverted at Rock Slough do not contain enough selenium to pose a significant health risk, and Los Vaqueros would further lower selenium levels.

PH1-2 The conceptual recreation plan places substantial emphasis on access from the north to facilitate use by CCWD ratepayers and other Contra Costa County residents. User fees will likely be required from all recreation users, although these fees probably will not completely offset the costs of implementing and managing the recreation facilities.

PH1-3 The Los Vaqueros Reservoir would provide CCWD with between 30 and 90 days of emergency storage, depending on the water year type. The specific criteria are described on page 1-5.

PH1-4 As part of its 404 alternatives analysis required by the Section 404 of the Clean Water Act, CCWD conducted a three-stage screening process that evaluated the advantages and disadvantages of a comprehensive list of alternatives, including desalination. This EIR/EIS constitutes the third stage of the screening process.

CCWD has not selected desalination as a preferred alternative for several reasons, including the following:

- Desalination in itself does not provide emergency water supplies and would not achieve CCWD's reliability objectives. CCWD has combined desalination with an emergency supply that could be obtained from EBMUD for analysis in the EIR/EIS. The reliability and amount of water available from EBMUD in the long-term, however, does not meet CCWD's project objectives.

- Because of the large amount of electrical energy required for the reverse osmosis process, the annual operating costs for the desalination plant would be over four times higher than the proposed action as described in Table 2-4a on page 2-45 of the EIR/EIS.

PH1-5 Vasco Road and utility relocations are a major component of the Los Vaqueros Project. CCWD has completed the Vasco Road and Utility Relocation Project EIR as part of the staged environmental documentation for the project and is now in the roadway design process. CCWD has not attempted to coordinate activities with the California Toll Road Company.

PH2-1 The draft EIR/EIS does not include conservation as a project alternative nor did other alternatives include conservation techniques. Because most of us live with various conservation techniques, I would have liked to see these issues addressed. Such conservation measures include timers for landscape irrigation, low-flow toilets, and hot water recirculating pumps.

PH2-2 I did not see access to Vasco Caves discussed in the draft EIR/EIS. In view of the fragile nature of the area, access should be limited to organized groups and not the general public. The presence of the fairy shrimp near the caves also contributes to the site's sensitivity.

PH2-3 I did not see addressed in the draft EIR/EIS various cultural resources that are believed to have served as Native American gathering sites. Specifically, I did not see discussed an area that included a large number of Indian mortars. CCWD should preserve this site and should relocate these resources if they are within the inundation zone of the reservoir.

PH2-4 CCWD has incorporated mitigation for impacts on wetlands. I would like to see CCWD design the reservoir shoreline as wetland habitat.

PH2-5 The loss of oak trees is a concern. To ensure survival of the trees, a minimum of 15-gallon trees should be planted in fall. Livestock grazing in the planting area should be banned because this would result in the destruction of the small trees.

PH2-6 We are concerned that grazing will affect water quality in the reservoir and contribute to the destruction of the natural habitat. Grazing should be restricted so that water quality is not adversely affected, attempts to reforest are not hindered, and the natural cycle of oak and other plants is not disrupted.

PH2-7 Although several other local reservoirs allow swimming, sailboarding, and other activities that involve body contact with the water, it is not clear whether CCWD would allow such activities at the Los Vaqueros Reservoir. Some discussion has also taken place regarding a swimming facility that would be separate from the main body of the reservoir. Other than for those who are boat owners, access to the Delta is limited. Public sentiment seems very supportive of reservoir recreation activities that involve body contact with the reservoir.

PH2-1 CCWD fully evaluated conservation measures as part of its 404(b)(1) alternatives analysis required by the Clean Water Act.

Water conservation does not meet CCWD's water quality or reliability criteria when considered as a single alternative. CCWD has incorporated water conservation in the planning assumptions and projected water demands developed to identify CCWD's future water needs. Consequently, any alternative or combination of alternatives that is used to meet CCWD's basic project purposes will inherently incorporate conservation as a component of the overall alternative.

PH2-2 CCWD does not own or control the Vasco Caves area and therefore does not regulate public access.

CCWD will incorporate measures into the Los Vaqueros Project that reduce the potential impacts of increased access to the Vasco Caves area to less-than-significant levels as described in the Vasco Road and Utility Relocation Project EIR and the Stage 2 EIR/EIS. CCWD and EBRPD have entered into an agreement to acquire certain lands in the Vasco Caves area and to develop an operating agreement to preserve the Vasco Caves resources.

PH2-3 The referenced site is above the inundation area. This area has been identified in the conceptual recreation plan as a controlled use area (i.e., an area where low-intensity uses that do not involve the loss of the resource could be allowed). Use of this area would be strictly controlled by use of signs and gates; monitoring and other controls will be employed to deter inappropriate use.

PH2-4 To obtain a permit from the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act, CCWD must mitigate for the impacts on wetlands. This mitigation includes a variety of replacement strategies that will need to meet with U.S. Army Corps of Engineers approval. CCWD has studied the potential for wetland development at the reservoir fringe to mitigate wetland losses. The fluctuating reservoir level, however, would inhibit the natural development of wetlands.

PH2-5 CCWD has committed to an oak mitigation plan that requires monitoring and remedial action should the mitigation fall short of the mitigation objectives. Although oak seedlings will be used for the initial plantings, irrigation and grazing management would be employed to optimize seedlings' chances for survival.

PH2-6 CCWD completed a study in 1991 entitled Grazing Intensity and Ground Squirrel Abundance in Annual Grasslands within the Kellogg Creek Watershed, Contra Costa County, California. This study showed that lands within the watershed that are in private ownership are generally overgrazed. Under CCWD ownership, grazing activities would be reduced to avoid water quality problems and to generally improve habitat conditions in the watershed. CCWD does not desire to severely reduce or eliminate grazing because this would result in unacceptable fire risk.

PH2-7 CCWD recognizes the community interest in swimming and water-oriented recreation. The conceptual recreation plan provides for a swimming lagoon separate from the main body of the reservoir.

PH3-1 CCWD should be commended on the job it has done environmentally and otherwise. We should move through the planning and environmental process quickly so that we will be prepared for future droughts or disasters.

PH3-1 Comment noted.

PH4-1 Three years ago, when the citizens of Contra Costa County voted on the ballot measure to approve funding for the project, it appeared that there would be two results. Water rates would rise substantially and the reservoir would be constructed within 5 years.

Rates have increased at the rate approximately one increase every 6 months, but the reservoir has not been built. Now the reservoir is only tentative, and it appears that rates will continue to rise.

PH4-1 Comment noted.

PH5-1 The Los Vaqueros Project cannot guarantee that CCWD customers will get better water quality, because project operations are based on precipitation and the Sacramento/San Joaquin Delta.

PH5-2 EBMUD has obtained a Sierra water source with the assistance of CCWD and the City of Antioch. CCWD customers also deserve such a high-quality water source. CCWD should not pursue a project based on the same water source we have now.

PH5-3 CCWD staff do not regularly attend SWRCB hearings to represent the interests of its ratepayers. SWRCB decisions are largely political.

PH5-4 The preparers of the draft EIR/EIS have not disclosed the full range of pollutants present in the Delta at the time CCWD would divert Los Vaqueros Project water from the Delta. The City of Sacramento has and will continue to discharge raw sewage into the Sacramento River during winter when project diversion is proposed. I am concerned that this problem has not been properly addressed.

PH5-5 The document recommends too much protection for wildlife species and not enough protection for CCWD's ratepayers who will pay the high costs of the project.

PH5-6 The document discusses recreation extensively, however, Contra Costa County voters did not vote for a recreational reservoir.

PH5-7 The document does not adequately discuss the water quality impacts of the intensive seagull use of the reservoir that would occur because of the proximity of several landfills.

PH5-8 The document states on page 16-14 and 17-2, respectively, that CCWD will pay in-lieu fees to affected local agencies and will provide water service to east county in the future. This is not equitable because east county residents will not pay for the initial cost of construction.

PH5-9 The document references a CCWD board decision not to include the east county area in the planning assumptions for the project. Contra Costa County voters did not give the CCWD Board of Directors the discretion to expand the project to include the east county area.

PH5-10 Without a discussion of the effect on the reservoir of raw sewage from the City of Sacramento, the document is inadequate.

PH5-11 The project would also substantially adversely affect salmon. This is unacceptable because salmon are a valuable food source for the people of California.

PH5-12 The project should not be constructed until the regional water quality control board rescinds the City of Sacramento's permit to release untreated wastewater flows during heavy rainfall events.

PH5-13 The document is not adequate until all the mitigation is in place.

PH5-1 It is possible that drought situations could delay initial filling of the reservoir and periodically prohibit CCWD from maintaining the reservoir at optimal levels. However, the Los Vaqueros Project has been designed to meet CCWD's water quality goals during such situations and CCWD has completed extensive modeling using existing hydrologic data for a 57-year period. The results of these studies have been used to determine the feasibility and design of the operations of the project.

PH5-2 As part of its 404 alternatives analysis required by the Section 404 of the Clean Water Act, CCWD conducted a three-stage screening process that evaluated the advantages and disadvantages of a comprehensive list of alternatives, including a Sierra water source.

CCWD found that developing a Sierra source would be unfeasible for the following reasons:

- The cost of developing a Sierra source would be considerably higher than the cost recommendations stipulated in the voter-approved measure authorizing funding for the project.
- Water rights that would permit such a project are unavailable.
- The project would have prohibitive environmental constraints and obtaining permits would probably be unfeasible.
- The project would require a long pipeline that would be subject to failure during a major earthquake and terminal storage. The terminal storage component alone could have environmental consequences similar to those of the entire Los Vaqueros Project.

Delta water quality problems are periodic. By avoiding these problem periods, CCWD would improve the overall quality of its water supplies.

PH5-3 CCWD closely follows the activities of the California State Water Resources Control Board regarding Delta issues and actively represents the interests of its customers on pertinent issues.

PH5-4 Because of the location of CCWD's Rock Slough intake, the flow patterns of the Delta and the great dilution factor of the Sacramento River and the Delta during such rainfall events, changes in water quality at the CCWD intake after such a sewage release would be undetectable.

PH5-5 CCWD believes that the mitigation measures incorporated into the project are appropriate and consistent with state and federal laws and CCWD board resolutions.

PH5-6 Recreation was one of the project components identified in measure W that was approved by voters within CCWD in 1988. Because, in part, of issues regarding project cost, CCWD has proposed a limited amount of recreation development. Costs of future recreation development would likely be borne by other funding sources.

PH5-7 A full discussion of the effects of roosting gulls is included on page 6-13 of the EIR/EIS. Based on the finding and conclusions of a report prepared for CCWD, water quality impairment of the reservoir from coliform and pathogen levels will not be a major issue of concern.

PH5-8 CCWD is purchasing the Kellogg Creek watershed, a large land area in east county, and is removing it from the county's tax roll thereby potentially reducing funding for some east county public service provides. Recreation uses at the reservoir could also increase the demand for a number of these services. CCWD believes that paying in-lieu fees is appropriate mitigation for these adverse fiscal impacts. CCWD has no plans to provide Los Vaqueros Project benefits to areas outside its existing service area.

PH5-9 Comment noted. One of the factors resulting in CCWD's decision to not include the east county area in the planning area for the Los Vaqueros Project was that ratepayers did not have the opportunity to vote on such service.

PH5-10 See response to PH5-4.

PH5-11 CCWD concurs that salmon are an important wildlife resource. As mitigation for Impacts caused by the proposed action, CCWD has modified its project operations to produce a net benefit for winter-run chinook salmon.

PH5-12 See response to PH5-4.

PH5-13 Except where required as permit conditions or where specified in the mitigation monitoring plan, federal and state laws do not require mitigation to be in place at the time the project is adopted or constructed.

PH6-1 The recreation document prepared for the project does not address mountain bikes. CCWD appears to have obtained data for the recreation plan by contacting other local agencies. We do not believe that these agencies are an effective source of data for our type of recreational activity. Please contact us for data regarding mountain biking.

PH6-1 CCWD has no plans to restrict mountain bikes from trails in the Kellogg Creek watershed, although some trails may be restricted at various times to minimize conflicts between various user groups, protect sensitive cultural resources, or other operational requirements.

As CCWD develops more specific recreation plans for the watershed lands, it will consult with the referenced organization on issues regarding bicycling.

PH7-1 Because of its proximity to the Tosco oil refinery, water at the Bollman Water Treatment Plant is contaminated. CCWD water supplies have substantially higher levels of water supply contaminants than EBMUD water supplies and CCWD will not act to remove them.

PH7-2 CCWD will be unable to fill the reservoir because the winter snowpack is not of sufficient volume.

PH7-3 The reservoir will not provide water quality benefits because the reservoir will contain unacceptable levels of sodium that CCWD will be unable to remove.

PH7-4 CCWD should admit that it is continuing to ration water supplies because it is requiring its customer to reduce consumption by 15% over last year.

PH7-5 CCWD did not fully disclose the true cost of purchasing the Kellogg Creek watershed lands.

PH7-1 CCWD has detected no contamination of its water supply from nearby industries. The Los Vaqueros Project will reduce the levels of most water quality contaminants. CCWD's water supply is also thoroughly treated and meets all state and federal drinking water standards.

PH7-2 See response to PH5-1.

PH7-3 The project has been carefully formulated to maintain a water quality goal at the tap of 65 mg/l chloride and 50 mg/l sodium. CCWD would maintain this goal by filling the reservoir during periods when Delta water quality is high. Currently, CCWD meets this water quality goal only 59% of the time. With the Los Vaqueros Project, this goal could be met approximately 90% of the time.

PH7-4 CCWD has maintained a volunteer rationing program with the intent of achieving a 15% reduction in customer use.

PH7-5 CCWD is required to purchase Kellogg Creek watershed lands at fair market value. In some cases, the value of lands has been higher than anticipated by CCWD.

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